ENGINEERING NEWS-RECORD

APRIL 17, 1958

PRICE 30 CENTS

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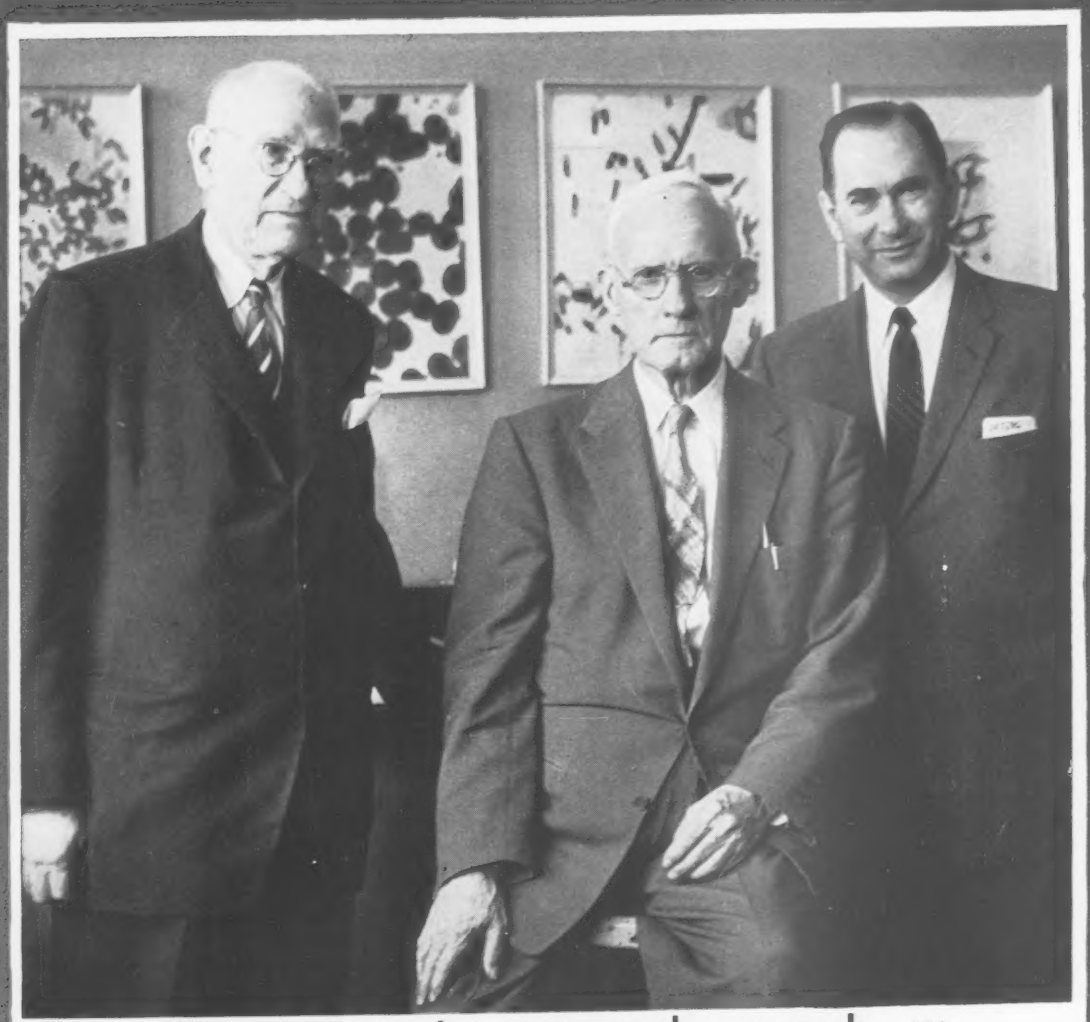

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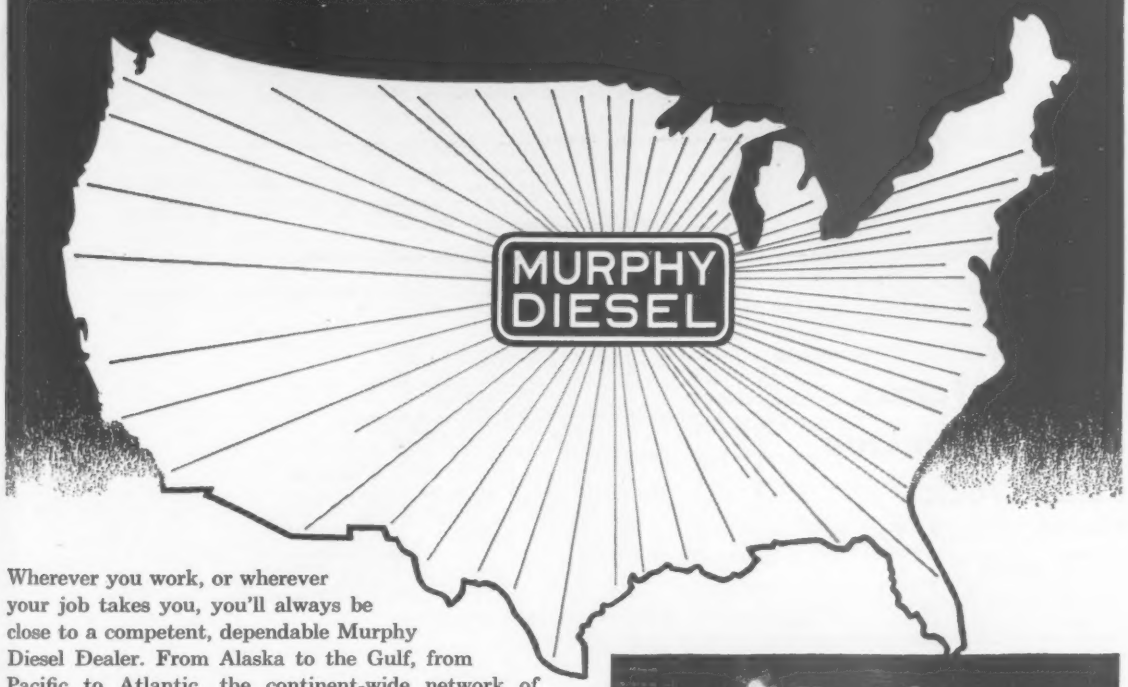

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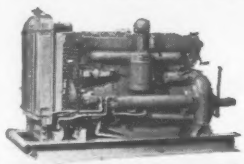

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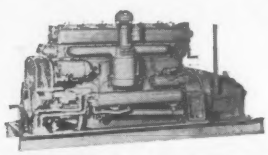

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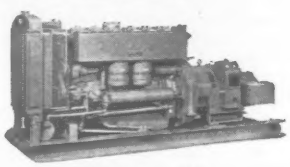

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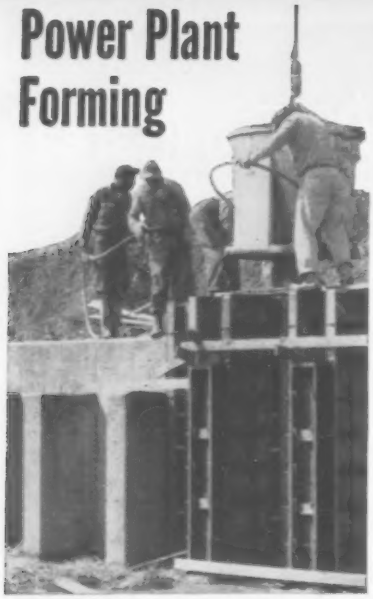
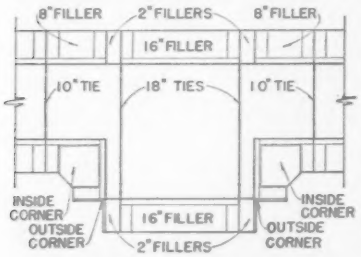


Symons Forms Help Contractor Race Clock

Pour 530 Yards of Concrete in 5½ Hours

Racing a siege of wet, windy weather, workmen on the new $10 million Blue Valley Station of the Independence, Mo. power plant, teamed up to pour 530 yards of concrete during one 5½ hour period.



Pilasters similar to the ones shown are easy to erect with Symons Fillers and Corners.

Sharp Bros. Contracting Co., Kansas City, the contractor, is using 8,000 square feet of Symons Standard High Strength Forms to pour 40,000 square feet of concrete. Much of the concrete is in thick slabs and pedestal bases with wall thicknesses varying from six to 84 inches. Symons 84-inch washer ties are being used in pouring pedestals for the turbines.

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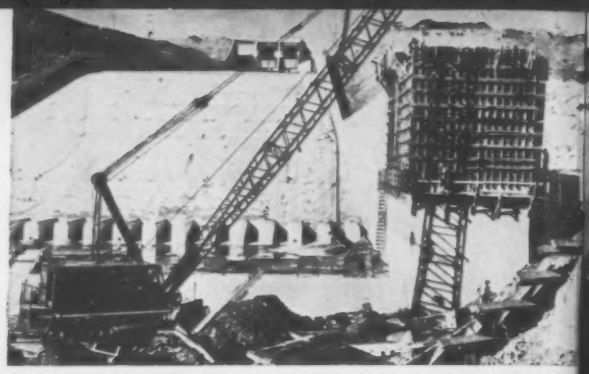
TEXACO PLAN was used from the start in construction of the Tiber Dam on Montana's Marius River. Dam is 205 feet high and 4,300 feet long.



TIME AND CONFUSION SAVED by Texaco Plan kept maintenance costs low during construction of Tulloch Dam in California.

These 5 great American construction projects use **Texaco Simplified Lubrication Plan**

These five projects represent hundreds of millions of dollars in construction costs. When you hit these figures, lubrication can be an especially big item. But on any size job, it's not the cost of the lubricants themselves but the difference between *planned* and haphazard lubrication methods that counts. The latter can cause unexpected breakdowns, costly overtime, and ruined equipment. But planned lubrication can speed project completion, minimize downtime, lengthen equipment life. That's why cost-conscious contractors are turning to Texaco's Simplified Lubrication Plan.

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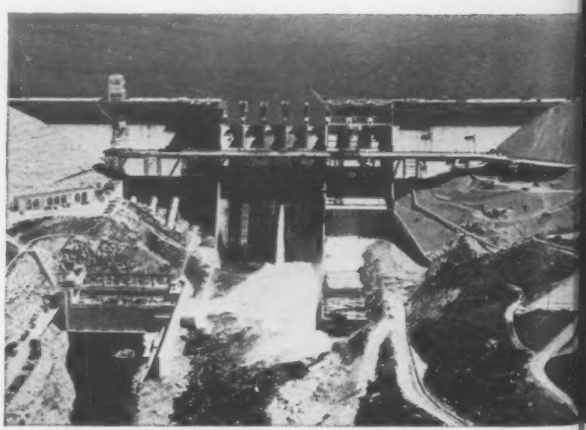
GET THE WHOLE STORY. Contact your nearest Texaco Lubrication Engineer *soon*. He can show you how much the Texaco Simplified Lubrication Plan has saved contractors in the past—how it can help you in the future. Just call the nearest of more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

LUBRICATION IS A MAJOR FACTOR IN COST CONTROL

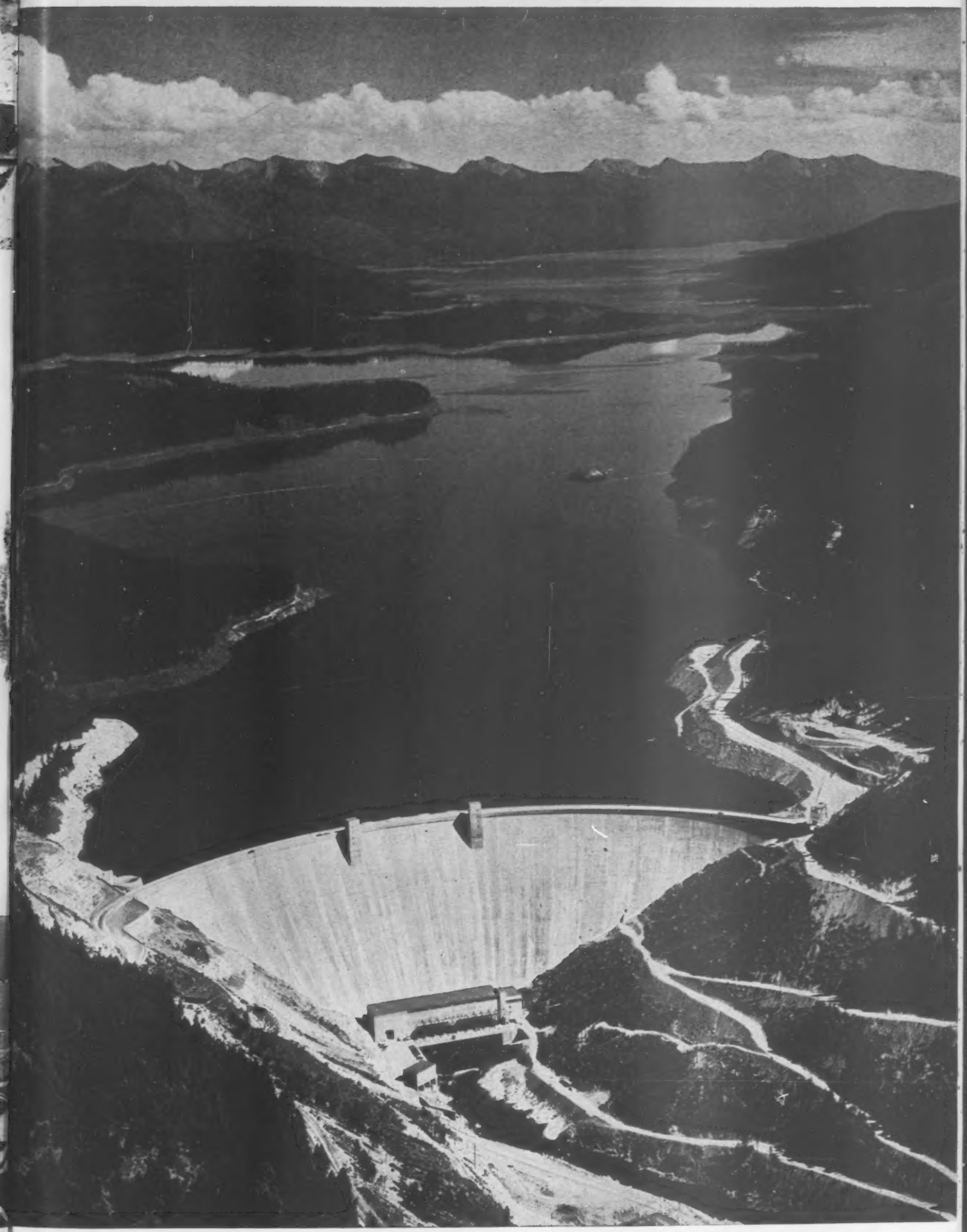
(PARTS, INVENTORY, PRODUCTION, DOWNTIME, MAINTENANCE)

WELL AHEAD OF SCHEDULE, Columbia River's Priest Rapids Dam is already more than one-third complete. Texaco lubricants are used exclusively.



WORLD'S LARGEST earthfill and concrete project, Folsom Dam on the American River, used the Texaco Simplified Lubrication Plan from start to finish.

HUNGRY HORSE DAM, MONTANA. TEXACO PLAN PLAYED VITAL PART IN ON-TIME PROJECT COMPLETION.



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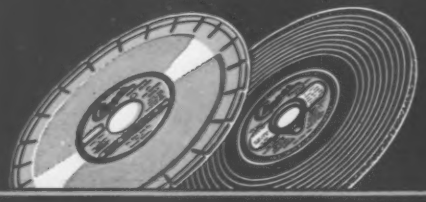

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Like steel, tire cord must be tempered to be tough. Goodyear's exclusive 3-T process, involving Tension, Temperature and Time, triple-tempers cord to make it TRIPLE-TOUGH—to give you longest tire life, lowest cost-per-yard.

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Mezzanine GIVES SAFE ACCESS TO UPPER BINS

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Reader Comment

Skid Tests of Pavement

SIR—We read with much interest the article by H. O. Thompson reporting on Mississippi's skid resistance tests (ENR Feb. 6, p. 54). Naturally we were surprised to see that concrete pavements did not average higher in skid resistance than reported in this article. After carefully studying the article, however, it becomes apparent that there are two factors not discussed in sufficient detail, which help to explain why concrete doesn't rank higher.

In the first place, the concrete pavements on the average were far older and had carried far more traffic than the blacktop pavements. For example, as shown in Fig. 2 of this article, the "age-traffic index" of the concrete pavements ranged up to 11,500. And even at this extreme, the coefficient of friction was above 0.45. In contrast, the bituminous pavements shown in Fig. 4 ranged up to a maximum "age-traffic index" of only 340, which is only 3% of the maximum value for concrete. Even at this very low value, the coefficient of friction was down to slightly over 0.40.

A second factor is that 28 pavements were found to test below 0.40 and were deleted from the study. If these had been averaged with the values shown in Fig. 5, concrete's relative position would undoubtedly have been improved.

In contrast with these test results, it is interesting to cite a test conducted by an impartial and nationally known research organization in Tennessee. Tests were conducted on wet concrete and blacktop sections of U. S. 41 near Smyrna, Tenn. The results showed that from a speed of 40 mph, the stopping distance on concrete was 76.9 ft, as compared with 180.2 on blacktop.

GORDON K. RAY
Manager
Highways and Municipal Bureau
Portland Cement Association
Chicago, Ill.

Pressure Creosoted Piles

SIR—The very informative article "Know-How Spurs Waterfront Project" (ENR Mar. 13, p. 42) will create a great deal of interest among those who design and build waterfront structures.

While I noted that reference is made several times to "composite wood and concrete piles", I find no mention of the fact that the main supporting piles for Pier 2 as well as some of Pier 1, are pressure creosoted piles.

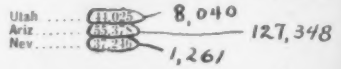
Although not discussed in your article, the unique design features of the substructure of Pier 2 render it 100% fireproof. There is no need for fire bulkheads in the substructure, nor is it essential to provide for cellar-nozzle holes in the pier deck.

RALPH H. MANN,
Sr. District Engineer,
American Wood Preservers' Institute
New York 17, N. Y.

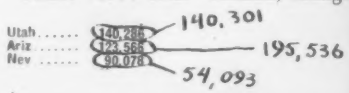
Glen Canyon Correction

The $108 million Glen Canyon Dam contract, incorrectly divided among Arizona, Nevada, and Utah in the contract totals reported in the Feb. 13, 1958 issue of ENR, all belongs in Arizona. This requires the following corrections:

Page 51—Under "earthwork, irr., drain," column, showing contract volume in thousands of dollars, change:



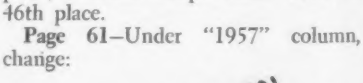
Under "1957 total" column, change:



Under "% change '56-'57" column, change:

Page 56—Chart of ENR contract awards ranked by states and showing percent changes 1956-57. Change Utah from "140 and +54" to "104 and +14"; Arizona from "124 and −33" to "195 and +7"; Nevada from "90 and +224" to "54 and +95"; Utah, therefore, drops from 29th to 36th place; Arizona rises from 33rd to 25th place; Nevada drops from 39th to 46th place.

Page 61—Under "1957" column, change:



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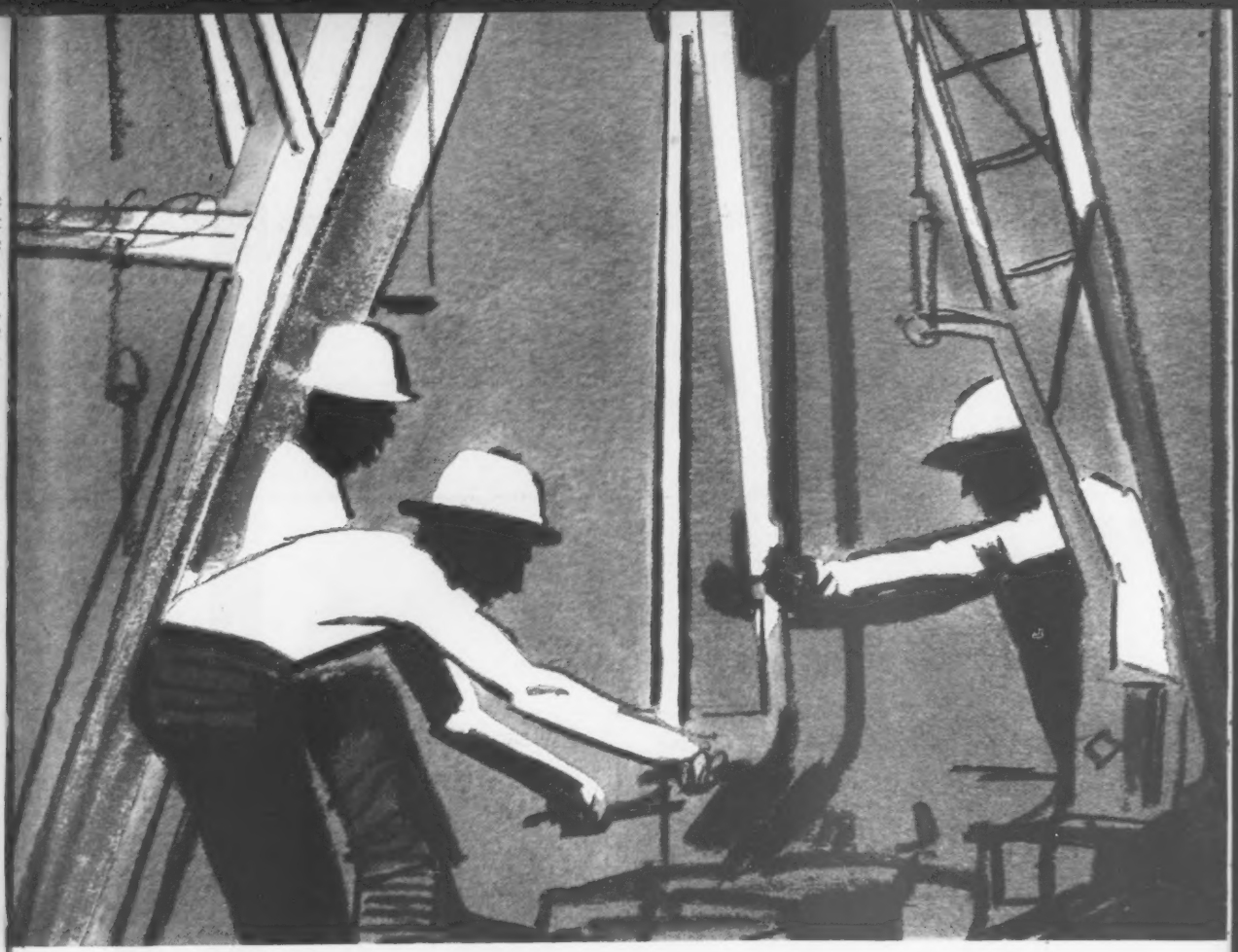

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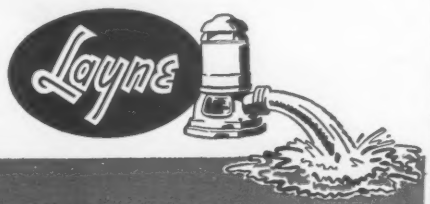

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The Top Contractors

ENR's story on the Nation's Top Contractors (ENR Jan. 2, p. 21) brought forth much comment in the form of additions to the list and enlargement of some figures.

The original listing counted only domestic contracts reported by ENR for work within the U.S., for parent companies exclusive of subsidiaries and for prime contracts but not subcontracts.

New data supplied by companies include different combinations for different companies, but give a better measure of the enormous size of the industry and the companies within it. The revised 1956 figures for commenting firms follow:

Morrison-Knudsen Co., Inc.

Straight M-K contracts	$94,984,000
M-K joint ventures (100% of contract value)	152,693,000
Sub-total (M-K only)	247,677,000
Domestic subsidiaries	94,242,000
Total domestic construction	341,919,000
Foreign subsidiaries	249,047,000
Total construction volume, M-K and all subsidiaries	$590,966,000

The firm also broke down its actual volume with joint ventures shown only for their percentages accrued to the company. On this basis, the totals were:

Parent Company	$165,846,000
Domestic subsidiaries	93,672,000
Foreign subsidiaries	124,192,000
Total M-K volume awarded	$383,710,000

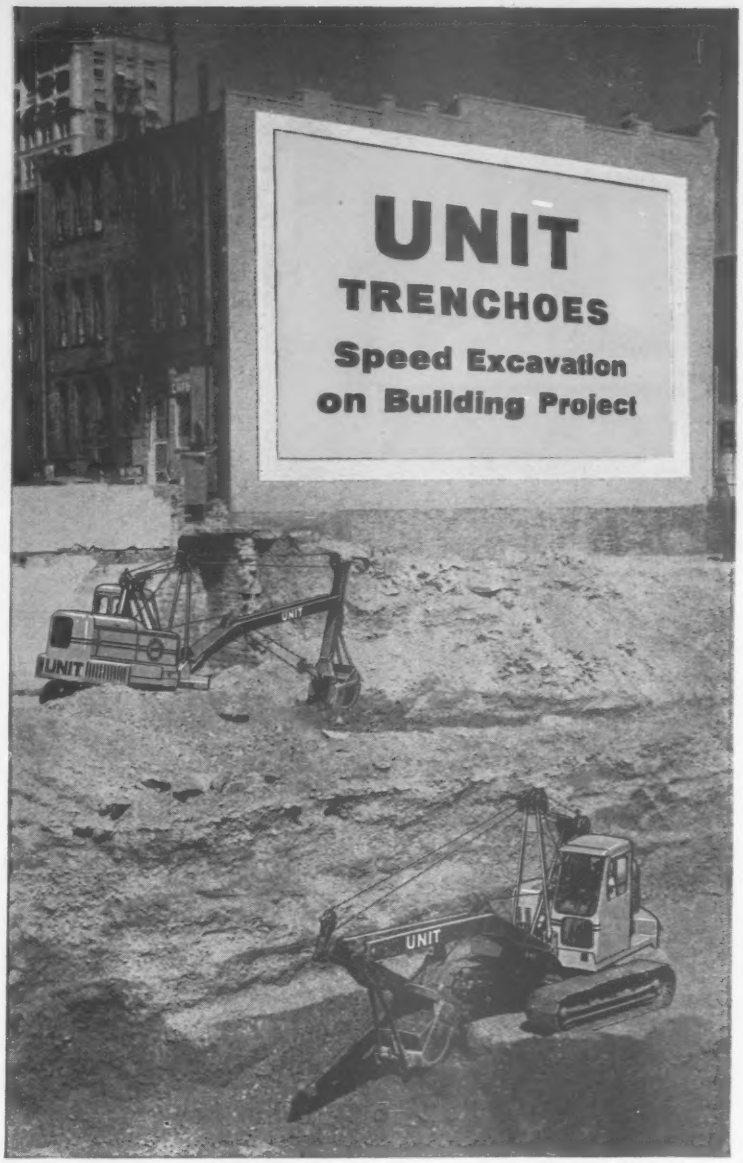
H. K. Ferguson Co. (wholly-owned subsidiary of M-K) Cleveland, Ohio.

Individually held contracts, (foreign and domestic)	$87,162,000
Share only of joint ventures	10,445,000
Total	$97,607,000*

*These totals are included in M-K figures, but were not included in original ENR total for Morrison-Knudsen.

Ebasco Services, Inc.
New York, N. Y.
(design and design/construct) $424,000,000

F. H. McGraw Co.
Hartford, Conn. & New York, N. Y.
(including work added to original contracts and some specialized work for other prime contractors) $244,000,000



• UNIT equipment was chosen by the contractor for digging this 25,000 yard excavation for a new Federal Reserve Bank Building in the heart of Salt Lake City. Quality, simplicity of design, economical operation and low maintenance costs are among the many reasons why contractors prefer UNIT.

UNIT Excavators are available in ½ to ¾ yard sizes . . . Cranes up to 35 tons. Crawler, Truck or Mobile . . . Gas or Diesel. Write for literature.

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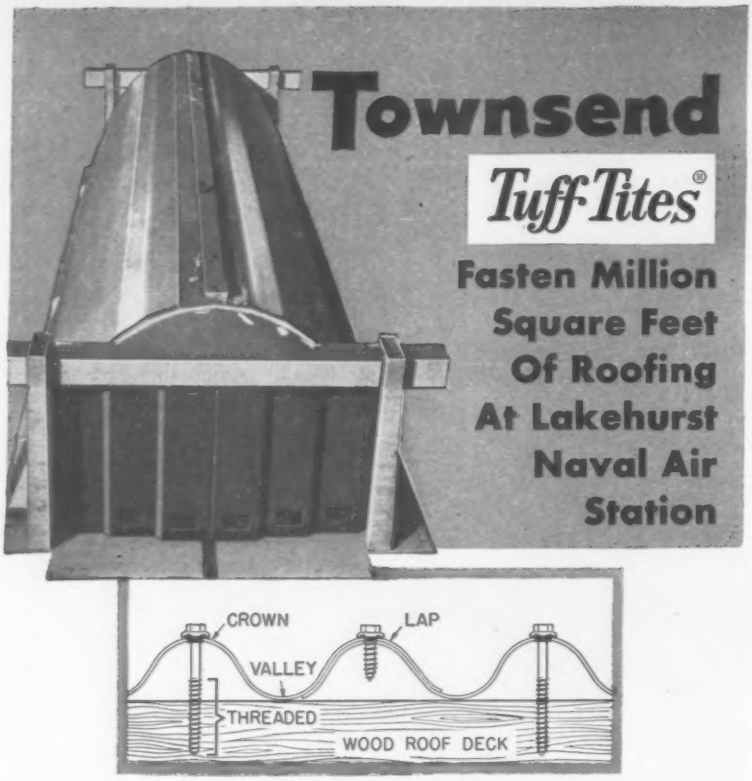

Townsend Tuff-Tite fasteners were selected to secure the Alcoa corrugated aluminum alloy roofing sheet on two of the world's largest aircraft hangers because their unique design provides great holding power combined with a watertight seal.

Previous roof systems, which depended upon nails to hold the roofing materials, failed when varying wind pressures and normal expansion and contraction caused the wood structures to flex. The nails worked loose, the protective coating became torn and blew off—the resultant leaks required constant expensive repairs. Almost a million No. 305 stainless steel Tuff-Tite screws now help provide a roofing system that will stay tight, withstand the racking of the timber frame and winds of hurricane force.

Townsend Tuff-Tite screws are made with the head and washer in one piece instead of two and are supplied with an assembled neoprene washer which is trapped and controlled by the undercut in the head when the fastener is tightened. The conical design of the neoprene washer helps lock the neoprene to the shank of the fasteners and serves to force it into the hole and seal it.

Tuff-Tite fasteners are available in stainless, carbon and alloy steel as well as many non-ferrous materials such as aluminum and copper. To learn how to achieve economical, watertight construction with Tuff-Tite fasteners, see the Townsend Company section of Sweet's Plant Engineering file, or write for bulletin TL-107. Townsend Co., P.O. Box 237L, New Brighton, Pa.

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In Canada: *Parmenter & Bulloch Manufacturing Company, Limited, Gananoque, Ontario*

. . . Reader Comment

Merritt-Chapman & Scott Corp.
New York, N. Y.
(includes $14 million in new additions to going contracts. exclusive of subsidiaries) $148,800,000

And to keep the record straight, J. H. Pomeroy & Co., Inc., San Francisco, was erroneously identified in ENR's story as James H. Pomeroy & Co., Inc.

The following companies are being added to the original listing of Top Contractors in 1956 to bring the total number of firms to 67.

Brown & Root, Inc.
Houston, Tex.
(including foreign and domestic individual and joint contracts) $449,182,155
(individual only, foreign and domestic) $262,340,930

Raymond International, Inc.
New York, N. Y.
(formerly Raymond Concrete pile Co).
(Total includes foreign and domestic joint and individual contracts) $274,842,000*
(Individual only, foreign and domestic) 73,677,000

* Totals include prime contracts and specialized work for other prime contractors.

The Rust Engineering Co
Pittsburgh, Pa. $103,040,000

Stearns-Roger Mfg Co
Denver, Colo.

Individual	$45,000,000
Joint venture	$38,000,000
Total	$83,000,000

Johnson Drake & Piper
New York, N Y

Individual	$68,762,000.
Joint venture, share only	$9,400,000
Total	$78,162,000

Except where designated, "share only" joint venture totals represent 100% of contract value.

CALENDAR

American Institute of Steel Construction annual national engineering conference, Chase-Park Plaza Hotel, St. Louis, Mo., April 17-18.

American Water Works Association, annual conference, Memorial Auditorium, Dallas, Tex., April 20-25, 1958.

Southern Municipal and Industrial Waste Conference, 7th annual meeting Duke University, Durham, N. C. May 1-2.

Consulting Engineers Council, Second Annual Board of Directors Meeting. Sir Francis Drake Hotel, San Francisco, May 1-3.

Purdue Industrial Waste Conference, 13th annual meeting, Purdue Memorial Union Building, Lafayette, Ind., May 5-7.

COSTS LESS TO BUY

A single, molded rubber gasket is the only accessory required. There are no bolts, no nuts, no followers, no couplings, no extras.

COSTS LESS TO INSTALL

Assembly is easy and rapid. Rate of installation usually is limited only by the speed of excavating the trench.

JOINT IS TIGHT

Bell-Tite forms a pressure-tight joint instantly. Restrained joint bursting tests prove joint stronger than the pipe itself.

This is it... CLOW Bell-Tite® Joint Cast Iron Pipe

ALL-WEATHER JOINT

You keep your schedules with Bell-Tite Joint cast iron pipe. It can be easily laid in a wet trench or even under water.

UNDERWRITERS' LISTED

All diameters through 24″ listed and inspected by Underwriters' Laboratories, Inc. for working pressures to 350 psi.

AMPLE DEFLECTION

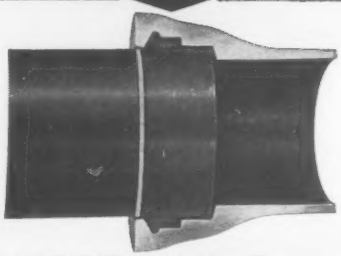
Bell-Tite Joint cast iron pipe is so designed that it will easily accommodate casual curves and normal grades.

MEETS ALL REQUIREMENTS

CLOW Bell-Tite Joint pipe is strong, tough, uniform and durable cast iron pipe for long-life underground service.

ANY SIZE OR THICKNESS

Available in any specified thickness or weight class in accordance with ASA, AWWA or Federal specifications. 3″ to 24″.



CLOW Bell-Tite Joint is easily assembled—Just wipe clean, lubricate and push spigot into the bell. When painted yellow stripe is no longer visible, joint is bottle tight.

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Contractors and Municipalities—men who know pipe—have installed well over 1,000,000 feet of CLOW Bell-Tite pipe.

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Iowa Valve Company, Oskaloosa, Iowa

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This 600 cu. ft. "Power Vane" Rotary is one of many on the St. Lawrence Seaway that are satisfying contractors' demands for 'round-the-clock, year-'round performance with no margin for failure.

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This easy-to-handle two wheel "Power Vane" Rotary is a favorite of utility construction men. It's ideal for getting to the job site quickly and getting the job done. Available in 125 and 210 cu. ft. capacities.

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Perfect for pile-driving — or any other "heavy demand" job — is the 900 cu. ft. CP Rotary.

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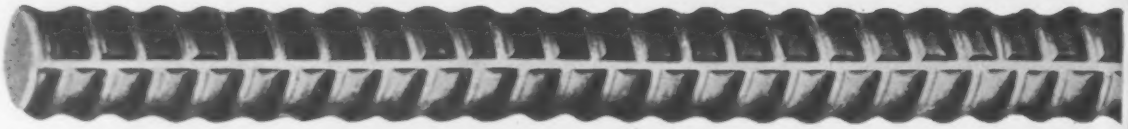

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Back issues of ENGINEERING NEWS-RECORD *are generally available for the previous six months. Semi-annual indexes will be sent on request.* ENGINEERING NEWS-RECORD *is also indexed in Industrial Arts Index and Engineering Index.*

THE CONSTRUCTION WEEK

BREAK IN PACIFIC NORTHWEST LOG JAM—The Corps of Engineers North Pacific Division has found construction of a 3.1 million acre-ft storage dam at the Knowles site on the Flathead River in Montana "entirely feasible," thereby triggering numerous possible developments in the current confused Pacific Northwest hydro picture. Unlike practically all of the other big flood control storage sites in the Pacific Northwest which are encumbered by international complications, fish and wild-life objections or excessive relocation costs, the Knowles site is available for early construction. Thus, a flood control project here estimated to cost $225 million could ease the pressure for incorporating large amounts of water storage in primarily power projects such as proposed on the middle Snake River.

UNEXPECTED SUPPORT—AFL-CIO building trades unions in California are fighting a statewide campaign to push through a right-to-work initiative that would ban the union shop. Under a program set up by the State Federation of Labor, local committees are disseminating information and central councils are holding public meetings and rallies. Unions are getting unexpected support from some employers. The Marin County Chapter of Painting and Decorating Contractors of California, for example, has gone on record as opposed to a right-to-work law on the grounds it would upset "good relationships between labor and management."

STEEL-WALL SHOW HITS THE ROAD—Ninety Cleveland architects last week attended the first of a series of steel curtain wall breakfast meetings being sponsored throughout the Northeast during the next few months by the U. S. Steel Corp. for local chapters of the American Institute of Architects. The meetings feature a half-hour film on "Chicago Dynamic," a week-long dramatization of Chicago architecture held last fall (ENR Nov. 21, p. 40). George Edson Danforth, chairman of Western Reserve University's architecture department and architectural consultant to USS, will moderate the discussions that follow film showing.

STAIRS MAY LOOK GOOD, BUT—Tired of climbing long flights of steps to reach their hilltop state Capitol in Nashville, Tennessee legislators are taking steps, as it were, to get around—rather under—the difficulty. In a tricky operation involving rock blasting beneath the foundations of the aging high-towered building, a tunnel is being sunk through the hill to provide a level approach to a subterranean chamber from which elevators will transport the solons upward.

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Penn-Dixie Mortar has all the other qualities that top-notch masonry demands—easy mixing, high yield, excellent water retention when mixed and water repellency when set. You'll like its sought-after color, too.

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WASHINGTON OBSERVER

- **Housing starts disappoint again**
- **Congress pushing local public works loans**
- **Engineers consider A-bomb for earthmoving**
- **Military construction keeps slowing**

● **Housing starts for March are disappointing** to those waiting for the industry to show signs of life that would help counter the business slide. The seasonally adjusted annual rate declined again: January was 1,030,000, February 890,000, and now March 880,000. In general, March weather was bad in many areas, and this is what is relied upon for an explanation.

The new lower down payments and government support of housing mortgages just made effective can be expected to give some sort of lift beginning in a couple of months. Housing chief Albert Cole says private starts should hit 1,050,000 this year, compared to last year's 992,800.

Lenders are showing a growing interest in GI mortgages at the present 4¾% rate. Appraisal requests—down to an extremely low point up to now—are up as much as 400% in some VA field offices. It's all an indication of the volume of mortgage money seeking suitable investments. In fact, many lenders are after the GI loan now, because they're convinced the effective rate will drop to 4½% before the year is out.

● **Government construction agencies are skeptical over AEC's campaign to interest them in A-bombs for earthmoving jobs.** Both the Army Engineers and the Geological Survey have been approached—and the Engineers are reported to be giving serious consideration to a classified project, perhaps the creation of a harbor at a remote overseas site through use of an A-bomb.

AEC officials report that several civilian construction firms have come up with concrete proposals for using the bomb.

The furore over whether secret blasts of this kind by the Soviets can be detected by our own scientists has confused the situation. There's some pressure to give the United Nations control over peaceful A-bomb blasts.

● **House leaders this week are pushing for quick action on a measure to pump out big loans to local public works.** The Senate version—the Fulbright bill—is being taken up by the Senate, after having been stalled by Republican leaders at President Eisenhower's suggestion. The Senate committee version would provide $1 billion in loans at a maximum of 3½% for a maximum term of 50 years.

The firing of the Administration's stand to "wait-and-see" before recommending a tax cut will tend to force quicker action on the public works lending measure, as well as other spending programs.

Public works and other spending programs seem to be more popular with the voters and congressmen than tax cuts. At least this is what most returning congressmen are saying. It isn't that the voters are against a tax reduction; but most of them say that such a small amount of money would be added to their pocketbooks that it would hardly be worth it. They're more interested in seeing out-of-work people get jobs—and apparently they think spending programs do more in providing jobs than a tax cut.

● **Military construction awards and expenditures aren't showing any pickup yet, according to latest Pentagon figures.** January obligations (contract awards) came to $85 million, February to $72.2 million; January expenditures for construction were $122.3 million, February $118.4 million.

The theory is that this is the result of last year's budget-cutting drive, that the freeing of military spending since Sputnik One last October hasn't yet had time to show up where it really counts.

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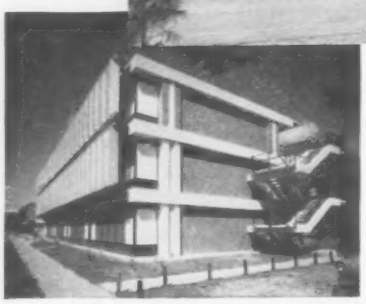
for a Fine Old Tradition



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BARKSDALE & LeBLANC,
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Architect and Engineer:
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The Spirit of Southern Hospitality Finds Dramatic Expression in These Modern New College Campus Buildings

● Memorial Student Union strikes a note of pleasing contrast amidst academic surroundings and architecture of by-gone days.

Set beside a small pond, overhung with magnolia and Spanish moss, the impressive structures dominate the social life of the students on the campus of Southwestern Louisiana Institute, in Lafayette, Louisiana.

Three interconnected buildings comprise the student union, housing the college bookstore, post-office, snack bar, ballroom and other recreational facilities.

Significantly, the structures are built with reinforced concrete to meet today's needs and the challenge posed by the generations of tomorrow.

Concrete combines great strength, economy, fire-safety and beauty in one versatile material, providing the widest possible latitude for the designer's creative skill backed up by sound construction know-how.

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Unemployment

☑ **He is tasting unemployment — although only for short periods in most areas.**

Competition

☑ **He must compete strongly for new jobs in private industry.**

Job Security

☑ **He is generally secure in his present job.**

Salary

☑ **His salary is holding firm.**

Opportunities

☑ **He is still in good demand in public agencies.**

Recession and Construction's Engineers

Marc Leggiero
Assistant Editor

A year ago, the civil engineer occupied an extremely comfortable position. Employers sought him out and many jobs went begging. The CE could pick, choose and refuse.

But how is he faring today, as many employers exhaust fat backlogs and face less abundant prospects of new work in the immediate future?

To answer this question, ENGINEERING NEWS-RECORD correspondents have contacted and questioned representative numbers of private engineering and construction firms, federal, state and local government agencies and employment services.

Out of their reports comes a loose but clear pattern:

- There is somewhat of a balance of supply and demand throughout most of the country.
- There is unemployment—although generally not the kind that keeps a good man out of work for any extended period of time.
- There are a few areas, such as parts of New England, where unemployment is substantial and even the competent man has to look to other regions.
- Salaries are holding up well—but the employer is looking for and getting better men for his money.
- Chances are that the picture will remain as is for at least the next few months.

The civil engineer looking for or thinking of changing a job will have to keep in mind that:

He will have competition—lots of it in some cases—for almost any job he might want in private industry. And he might have to wait a few weeks for the job to materialize. Engineering and construction firms generally find the civil easy to come by; job applications have been running at a high volume, with some tapering off only recently.

He is probably secure in his present job. While some are cutting back, others are replacing men who leave and a small number are adding new men. But most employers are trying hard to hold the line—neither firing nor hiring.

He is still in good demand in public agencies and for overseas work. Except in a few areas, federal, state and local agencies are using this opportunity to get men they once could not interest.

In almost all cases, the graduating student will find his job this spring after doing a certain amount of hunting. Interviewers are more aloof and more selective but they are talking to the graduating classes—however, the student will have to do the pushing.

The civil engineer's lot is pointed up in the following capsules on cities and areas throughout the U.S.

- **Detroit**—Employment in this city goes from stable to rising, depending on whether the civil engineer applies to private firms or civil service.

General tendency of the firms is to stand pat with what they've got. However, the city's civil service commission proclaims adequate work for the civil engineer. Quoting one spokesman, "There's been a continuing need, in city and county work, for the civil engineer. In fact, there's quite a shortage of the beginning civil, and we'd hire 15 or 20 more if we could get them."

(*Continued on page 22*)

. . . A look at spots across the country

"The recession is being felt among civil engineers."
A construction company

"There are no good CE's walking the streets looking for work."
A consultant firm

"We certainly have not cut them [salaries] and have not found it desirable or necessary to increase them."
A consultant firm

"Yes, we're looking."
A state roads commission

"We'd hire 15 or 20 more [beginning civils] if we could get them."
A city civil service

• **Sacramento**—California's capital city—rich in public agency offices—has more civil engineer jobs than men to fill them. The feeling in this area is that a civil could walk into any of these offices and practically go to work.

The Corps of Engineers, U. S. Bureau of Reclamation, state division of highways and state department of water resources are ready to take on men. The department of water resources will go after several hundred engineers when its new budget goes into effect July 1. The Sacramento District office of the Corps would "find a spot in a hurry if a civil engineer walked into the office."

Most private firms are currently holding fast. Consultants Bleifuss & Hostetter visualize no further reductions in the next three months, and no improvement until July. Packard, Muir & Train dropped 12 survey men but no engineers.

• **Boston**—The gloomiest spot, according to reports received, is New England. Miss Mildred Powers, supervising manager, Professional-Clerical Section, Massachusetts Division of Employment, estimates—through job claims and applications—that there are as many as 500 unemployed civil engineers in Greater Boston. And no basic improvement is in sight for the next three months.

It is the personal opinion of Ernest A. Herzog, chairman of the Surveying and Mapping Section of the Boston Society of Civil Engineers, that an estimate of 400 to 500 is reasonably accurate. George M. Reeves, vice president of Turner Construction Co., states: "The recession is being felt among civil engineers."

None of the engineering and construction firms contacted anticipates layoffs, but only a few said they were hiring or expecting to hire in the next few months. One large firm is said to have laid off 150 employees, many of them civils, last December, and is now hiring them back on a highly selective basis.

The Massachusetts Department of Public Works reports no layoff of permanent civil engineers recently.

One bright spot was provided by Charles Ingalls of Metcalf & Eddy, sanitary engineering consultants. He says the firm hired 20 civils in the last eight weeks and expects need for another 20 men in the near future.

• **Seattle**—In the Seattle area there is no appreciable unemployment among civils. Supply and demand are now nearly in balance, says Prof. A. L. Miller, civil engineering professor in charge of placement at the University of Washington.

He points that for the current crop of graduates there are still more job opportunities than men—but only 2 or 3 per man instead of the 5 to 9 of recent years. Professor Miller also notes that it is not as easy for older engineers to change jobs.

Private employers in the area generally agree there is a healthy state of employment, although most of them saw an unusual number of job applications earlier this year.

Boeing Airplane Co., largest employer of civil engineers in the area, laid off very few in the last six months. It has hired a number this year and expects to have openings for more before the end of the year. The Corps of Engineers district office has replaced civils who left and expects to take on four or five more in the next 30 to 60 days.

Design engineers are having no trouble finding jobs in either structural or sanitary work, says W. Wesley Brock of National Personnel Service, employment agency for the Puget Sound Engineering Council. He also notes that while employers are tightening requirements, salaries are not down.

• **Cleveland**—Civils are sitting tighter in their jobs around this area. Salaries are steady, and not many requests for jobs are coming from the CE's. The city, with its largest works program of the last ten years, would hire engineers with experience in road, sewer, bridge and freeway work if it could find them.

According to placement bureau officials at the Case Institute of Technology, all but two of a class of 27 ·
have had job offers to date; mean a·
age salary is slightly above last year.

• **Baltimore**—A dozen sources in the Baltimore area sum up the situation as follows: few civils let go in the last three months; future hirings to depend on business; salaries little affected. There is still a search on for good men.

A. R. Vollmer, of Whitman, Requardt & Associates, consultants, notes that salaries are holding steady: "We certainly have not cut them and have not found it desirable or necessary to increase them." The firm has neither laid off civils nor does it now plan to hire in the next three months.

The Arundel Corp. reports no layoffs, with additions to depend on business and salaries generally not fluctuating. Knoerle, Graef, Bender & Associates, engineer for the Illinois tollroad, also has not fired recently and could not say what hiring would be in the near future.

William Bender, personnel director for the Maryland State Roads Commission, largest employer of civils in Maryland, said there have been no layoffs, and as for hiring: "Yes, we're looking." The commission can use about 75 engineering graduates during the next five years. It could take on 15 or 20 civils now "if we could get them for $6,000."

• **San Francisco**—A generally fair picture is present in the San Francisco-Oakland section of California. The East Bay Municipal Utility District, Oakland, which has over 50 CE's on the payroll, reports no cutback or decreased salaries. It has even started hiring a few engineers for its projected $282 million expansion program.

The Bechtel Corp., San Francisco, has been laying off. It has let go, nationwide, 35 to 40 civil engineers in its design offices.

Morrison-Knudsen Co., Inc., with its international offices located in San Francisco, has kept a static force of engineers—not hiring a new CE since last August. But it isn't cutting back either.

J. H. Pomeroy & Co., San Francisco, is hiring civil engineers for both design and construction, "mainly because of construction activity abroad."

Kaiser Engineers Division of Henry J. Kaiser Co., Oakland, has terminated 40 CE's and draftsmen—not in connection with the recession but because it was phasing out several major construction projects. When new ones get under way "we probably will start hiring."

At Stanford—as at almost all schools contacted in this survey—interviewing companies are being more selective this year and students are being a little less particular, although there is no noticeable change in salaries offered.

A more somber picture is painted by Joseph R. Decker, western representa-

tive for the Engineering Societies Personnel Service. He sums up 1957 as being the worst employment year for engineers during the post World War II period. He states that 125 civils have registered for jobs this year compared to about 50 for the same period last year. He also feels that salaries are being downgraded.

• **Los Angeles**—Employment for civil engineers in the Los Angeles area has been worsening progressively for six months. Mrs. Carol Rakous of the California State Department of Employment reports that there are more than 50 civils on file, twice as many as three months ago. "Private industry has been laying off civil engineers and has been hiring very few," she states. This is repeated by other employment agencies, who add that practically the only demand is from government.

Southwestern Engineers has let go about 5% of its CE's in the last six months. Another firm, on the other hand, says it has picked up its number of civils by 25% in the last three months. This firm states, however, that it does know of a lot of CE's being let go by architect-engineer companies.

• **Middle Atlantic**—In the area covering Greater Philadelphia, Eastern Pennsylvania, South Jersey and Delaware, while there is unemployment among civil engineers, it is neither extensive nor of serious proportions; salaries have not yet been affected. Toll is highest among civils on the staffs of engineering and construction firms whose business is mainly in the fields of industrial and utility construction.

Firms have almost run out of backlog, and if there is no pickup in the next three months, there may be some further trimming. In local engineering schools, the wild recruiting rush has become a thing of the past.

The supply of CE's in heavy construction (roads, bridges) still continues to run slightly behind demand.

• **New York City**—The employment situation here can be characterized as slow and spotty. It varies from company to company. There are many CE's looking for jobs. And they are finding them —perhaps not the one they would like most, and in most cases after a period of searching. The applicant list in agencies keeps turning over, with no good man remaining on it too long.

One big engineering firm reports that, although it is doing no hiring, applications have been coming in at a good rate. It hopes to keep the men it has and these men seem content to stay. The salary line is being held; increases will be closely scrutinized.

Tippetts-Abbett-McCarthy-Stratton, international consultant, has noticed no increase in applications and is still hiring some CE's for its overseas work. It has not cut back salaries or the men in its local offices.

• **Southeast**—There are still plenty of jobs available for the civil engineer in the Southeast. State highway departments are in the market for civil engineers and other groups, such as the Georgia Highway Contractors Association, are on the lookout for CE's.

The demand continues good, according to placement officials at the Georgia Institute of Technology, and most of the demand is attributed to the federal interstate highway program.

• **Dallas**—No unemployment problem for the civil engineer is being experienced here. Only one instance of any layoff was found in a check with a number of consulting firms, the state highway department and the City of Dallas. Most firms state they are continuing to hire on a normal basis.

The Texas Employment Commission notes few applications from civils and not enough unemployment to affect salaries. The Texas Highway Department, Dallas Branch, has been hiring and will continue to do so. It also sees general supply and demand picture as normal, with no untoward effect on salaries.

• **Chicago**—The Chicago area has seen a tightening up in some instances during the last three months, but no large number of civil engineers are out of work. Salaries remain little changed. There is a larger supply of engineers on the market and some highly qualified men are taking jobs with federal, state and local government agencies in the absence of better jobs with private firms.

One large consulting engineer firm has reduced employment in its Chicago office by about 10% in the last three months and looks for little change in the number of engineers it will employ in the next few months. While not hiring many new people, another firm, De Leuw, Cather & Co., has laid off no one and probably will not.

Consoer, Townsend & Associates has not decreased its staff in recent months although it has replaced some engineers with more competent workers. It looks forward to hiring more men before long.

Bates & Roger, contractors, have made and anticipate no change in employment. Another contractor, Herlihy-Mid-Continent Co., expects to take on more people as the season progresses.

The Illinois Employment Service, Professional Division, reports a definite decrease in job openings and a definite increase in the number of civil engineers seeking new jobs.

• **Colorado**—A. A. Boese, placement representative for the Colorado Society of Engineers, Inc., says it has "been pretty tough the last three months." The number of CE's wanting jobs has increased from 22 in January to 32 in February and to 42 by mid-March.

Firms such as A. J. Ryan & Associates, Associated Engineers, Inc., Ken R. White have made some cutbacks lately or have not replaced terminations. The Colorado Department of Highways calls its employment stable with no layoffs or hirings, little change expected.

• **New Orleans**—No engineering firm contacted in the New Orleans area reports having laid off civil engineers in the last three months, and several indicated that they will hire more in the next quarter. They did say, however, that job applications have increased—many from out-of-state and willing to take lower pay to get on payroll.

Employment agencies do not yet consider the CE a problem. While there aren't as many openings, there is no great trouble placing applicants.

• **Portland**—The Portland, Ore., area reports a static situation: Turnover is very low, still no great layoffs. It is more or less a buyer's market—if the buyer wanted to buy.

Stevens & Thompson, consultants, has added to its staff in the last three months, contemplates no change in the next three. Moffatt, Nichol & Taylor, consultants, reduced its staff of civils by 2 out of 25 and plans no increase or decrease in the coming three months.

While the increase in number of job applications brings forth statements such as, "It would appear personnel is not too difficult to get," and "Civil engineers would probably be easier to come by if we need them," civil engineers in this area are not hurting.

• **Omaha**—The Missouri River Division of the Corps of Engineers, Omaha, is able for the first time since before Korea to get all the CE's it wants.

Peter Kiewit Sons Co. has not laid off any civil engineers although at present it has more than it needs in some areas. Other private firms also detect a slackening of demand for the civil. But, as Stan Michael of Kirkham-Michael Associates says: "There are no good CE's walking the streets looking for work."

In brief, it does not appear that the CE has been singled out for any special degree of unemployment. The current recession has touched him as it has all other groups. It might be that the blow seems harder because he has had to relinquish his relatively favored seat of yesteryear and enter the standard situation of supply and demand for a professional group. And that, more than likely, will be his employment lot for the future.

Sewerage Federal-Aid Battle Shapes Up

A battle in Washington is shaping up over whether to double federal-aid funds to cities for sewage treatment facilities or shift the grants program to the states.

Spearheading the move to increase federal aid are such key congressmen as Rep. John A. Blatnik and Sen. Dennis Chavez who head the committees that handle water pollution bills; the American Municipal Association; and the big conservationist organizations. And, for the first time, the big spending advocates can count on the unqualified support of state water pollution control officials.

They are heading for an early showdown with the White House, which has its own plans for killing the federal-aid program and is expected to oppose its expansion adamantly.

First move is expected shortly. Chairman Blatnik of the House rivers and harbors subcommittee is shooting for late-April hearings on bills to double the present $50 million a year of construction grants and to extend them another two years to 1958.

Sewerage Projects Ready for Construction

Area	Federal Allotment	Fiscal 1959			Fiscal 1960		
		No. of Projects	Project Cost	Federal Share	No. of Projects	Project Cost	Federal Share
	(In millions)		(In millions)			(In millions)	
20 East Central States	$21.3	476	$314.8	$56.0	378	$321.3	$50.5
17 Western States, Hawaii and Alaska	14.0	470	139.8	30.8	363	166.8	27.0
9 South-Southeastern States and Wash., D.C.	9.9	263	68.8	16.9	234	78.8	16.0
Totals	$45.2	1,209	$523.4	$103.7	975	$566.9	$93.5

The White House has already scheduled its main counter-move for the annual Governors Conference at Miami in late May. President Eisenhower has served notice that he wants to end federal aid on June 30, 1959.

He is prepared to ask the governors to take over the role of financially aiding their municipalities in exchange for a 40% share in federal telephone tax revenues. The deal—which would require a change in federal and some state tax laws—would take effect July 1, 1959.

Officially, the White House takes the position that financial aid to clean up municipal drinking water is more properly a state than a federal function. But, conservationists claim the underlying reason for the Administration's position is the fear that heavy polluting industries as paper and pulp, coal, and textile will become the major target of a federal anti-pollution drive as the municipalities bring their waste problems under control. These industries, so the argument goes, are less worried about state control.

By holding his hearings before the governors meet, Mr. Blatnik hopes to add to the Administration's already formidable difficulties in selling the governors on this scheme. The White House will have an even tougher selling job, he feels, if Congress—in the interim—launches a serious bid to increase the amount of federal grants on a long-term basis.

In that event, the state leaders are almost sure to see the Administration's proposal as saddling them with a much heavier financial burden than the $50 million a year in construction grants that Washington shoulders today.

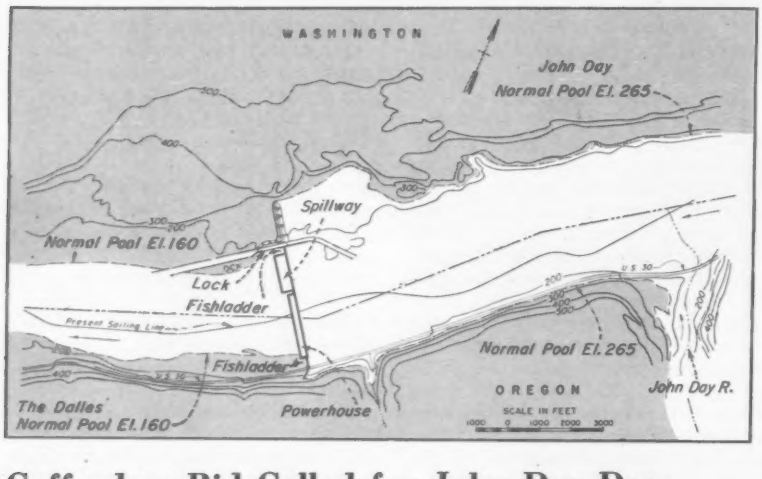
And, unless the states agree to take over this load, it is doubtful that Congress will refuse to continue the federal-aid program even if the White House makes good its threat to seek a cut-off.

Besides doubling the current federal program, Rep. Blatnik's bill would give more aid to larger cities by raising from $250,000 to $500,000 the limit on federal funds for each project, with the present limit of 30% of the project's total cost returned.

His proposal also would eliminate a provision of the present law barring communities within metropolitan areas from pooling their federal grants for the construction of joint facilities.

The aim is to provide new incentive for early anti-pollution action by larger cities and their suburbs. Now, the federal-aid program has been largely a small town attraction with 94% of the grants approved for cities of under 50,000 population and two-thirds for towns of 5,000 or less.

The Blatnik bill also would permit



Cofferdam Bid Called for John Day Dam

The Walla Walla District of the Corps of Engineers has announced that bids will be called in June on the first step cofferdam for $350 million John Day Dam. This is the most definite indication yet that the controversial Columbia River structure will be brought to an early construction start.

The cofferdam will cost an estimated $3.3 million and will be installed out from the Washington shore of the Columbia River. It will enclose the navigation lock and part of the spillway section.

John Day will be a straight-line axis dam with an initial 1.2 million kw powerhouse on the Oregon side containing 12 units. Studies are under way to determine when up to eight additional units will be needed.

The 86 x 675 ft navigation lock will have a 110 ft high maximum lift, making it the highest single lift chamber yet planned. Spillway capacity at John Day will be 2,250,000 cfs. The project is located at river mile 215.6, 25 miles upstream from The Dalles Dam.

If construction gets under way this year as planned, first power is expected in 1969.

the U. S. Surgeon General to reallocate on any "reasonable and equitable basis" grant funds that remain unobligated at the close of each fiscal year. Under the 1956 law, if the cities in a state could not spend the total state allocation, the money reverted to the federal Treasury. So far $5 million has been returned and next year, unobligated funds are likely to reach $7-to-$10 million.

In the Senate, Chairman Chavez of the Public Works Committee for some weeks now has been plugging a $100 million federal grants program as a short-term anti-recession measure. But, Congressional strategists are leaving the first move to the House, whose members are closer than senators to pressure exerted by city hall.

• **Would boost construction**—Recent surveys strongly indicate that an increase in federal grants would produce an immediate and sharp rise in the number of sewage treatment construction projects placed under contract. At mid-March, state agencies and the U. S. Public Health Service were processing applications for $66 million in grants while the cities were preparing another $22 million for submittal. And, at that date, PHS had used up all but $19 million of its grants funds. Together, the $88 million of grant applications in process or preparation cover some 900 projects with an estimated total cost of $687 million.

PHS officials figure that each $50 million of federal grants stimulates about $250 million of sewage treatment construction which requires 26,000 man years of labor.

Probably the best measure of how much additional construction can be expected from a straight 100% rise in federal grants was produced by the Poole-Everts-Lee survey made last fall (ENR Oct. 17, 1957, p. 74), and updated this February (see table).

The 46 state agencies replying said they could put under construction by this June 30 about 1,000 projects with a total cost of $537.2 million. These would need $98.9 million of federal grants.

The survey also showed these same states could get into construction $1.6 billion of treatment projects over the three-year period ending June 30, 1960 given federal grants of $296 million.

These projections make no allowances for the additional construction that might be generated should Congress adopt amendments to increase the maximum allowable grants to $500,000, permit the pooling of grants in metropolitan areas and reallocate unused grant allotments.

The $600 million-a-year construction rate that could be sparked by a doubling of existing federal grant aid is a big jump from last year's $351 million in sewage treatment works (which covers only interceptors and treatment plants). Another $200 million was spent in 1957 for local collection systems, according to ENR contract award reports.

State water pollution control officials were originally opposed, or at best luke warm, to federal grants. But, now they're among the most enthusiastic boosters for an expanded federal program. Meeting in Washington in late February, they strongly urged that the present $45 million annual appropriation be "at least doubled as an anti-recession measure."

Prestressed Beams Make Skyscraper Debut

Prestressed concrete will reach new heights this summer when erection gets under way on the 21-story Norton Building in Seattle, Wash. In their first use in a U. S. building higher than six stories, prestressed concrete beams will span 70 ft to support the upper 16 floors of the structure.

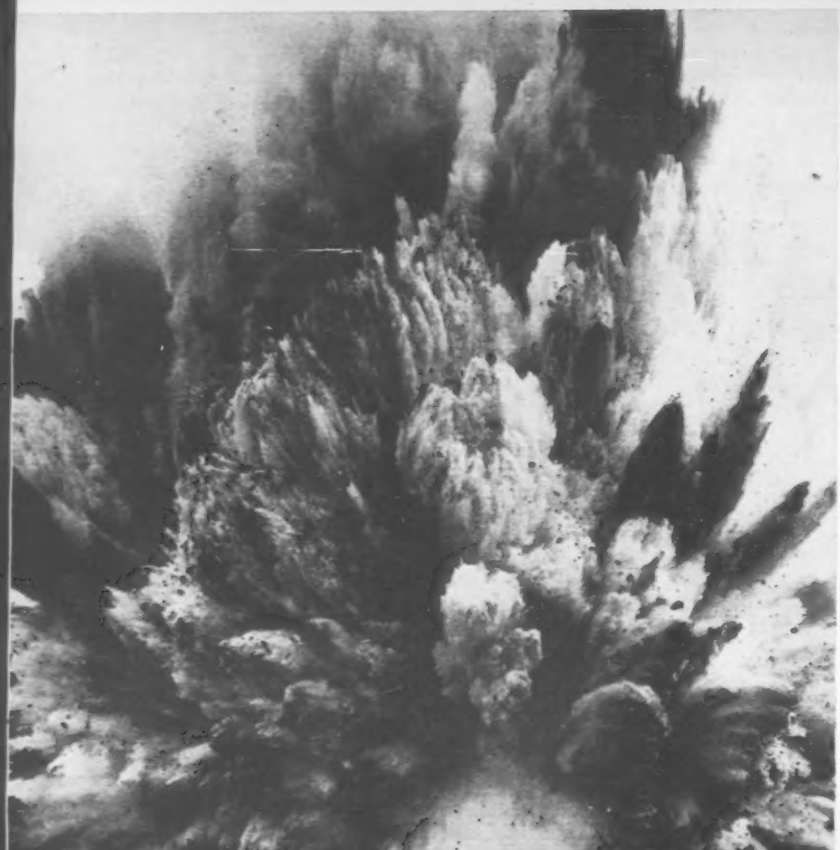
Construction of the $12 million project has already begun. The Concrete Technology Corp. is at work in Tacoma, Wash., making the prestressed concrete beams, of which nearly 300 are required. And foundation work got off to an impressive start with the placing of more than 1,500 cu yd of concrete in 6¼ hr for a 7 ft thick mat for part of the building.

Up to the fourth floor, which is ground level at the high side of the sloping site, the building is conventional reinforced concrete construction. From there up, it is a combination of steel and prestressed concrete.

A typical floor is 210 x 70 ft in plan —three bays long, one wide. Columns, transverse girders and a core structure at the center of the building will be framed in steel. Longitudinal beams will be the prestressed concrete members. Spaced 10 ft apart, the beams will be 37 in. deep and will have 20 in. wide flanges.

Bindon & Wright, Seattle architects, in consultation with Skidmore, Owings & Merrill, of New York, designed the building. Howard S. Wright & Co. has the general contract, and Isaacson Iron Works will erect the steel and concrete frame.

Ripple Rock



BIG BLAST involved 2.75 million lb of powerful high velocity explosive to shear off submerged rock peaks that posed major navigation hazard in Inside Passage to Alaska.

The big blast at Ripple Rock on April 5 which captured the avid interest of TV and newspaper audiences throughout the country is proving of equal interest to construction men.

Aside from its being the world's largest non-atomic explosion (barring some very recent Russian claims) the Ripple Rock detonation will prove invaluable as a guide for future large underwater shots, an aspect of blasting that had precious little experience to go on until recently. This is the considered opinion of F. D. Bickel, DuPont's explosive expert who consulted on this phase of the work at Ripple Rock.

A total of 1,375 tons of nitramex 2H, an 80% high velocity high density DuPont blasting agent, was placed to shear off two submerged rock peaks hindering navigation in the Inside Passage to Alaska about 100 miles north of Vancouver, B.C., to a clear water depth of 40 ft, moving 155,000 cu yd of rock in the process. Preliminary measurements show clear water depth of 47 ft, with between 200,000 and 300,000 cu yd of rock moved into deep water around the hogsbacks which had projected within 9 and 20 ft of the surface at low tide.

In bunkers 6,000 ft away the blast waves were hardly perceptible, while residents five miles distant could not

WHIRLPOOLS fused by hidden hogbacks projecting within 9 and 20 ft of surface at low tide are visible in the 2,500 ft narrows. Blast cleared depth to 47 ft.

CANADIAN JACKHAMMERS were employed in mining network of coyote holes.

Is Pioneer Underwater Shot

tell when the blast had been triggered.

Situated in a 2,500 ft wide narrows, the two peaks were reached through a 570 ft shaft on shore, a 2,000 ft tunnel and a network of raises, drifts, sub-raises. This phase of the $3 million Ripple Rock project was detailed in ENR June 28, 1956, p. 32.

When mining was completed, the pinnacles were honeycombed with 3 x 5 ft coyote drifts driven to within 40 to 50 ft of the rock exterior. A total of 72,000 waterproof tins of explosive 2 ft long and 5½ in. in diameter were placed in the coyotes over a seven week period, exposing the charge to salt water seepage for that period. Special primers were placed every 20 ft and were fused with Primacord protected by sandbagging in the tunnel and piping through the vertical excavations.

To assure that the exploded rock would slip off into deep water on either side of the peaks and not into the saddle between them, the blast was begun at the center of the lower outside coyotes on the flanks of the peaks and progressed towards the end of the hogbacks, also ascending to the central coyote at the peak of the rocks.

DuPont ran extensive tests firing concrete blocks underwater to determine the proper amount of charge. It was finally decided to load 10 times the amount normally required for blasting rock into air. This meant an average of 11 lb of explosive for every cu yd of rock and 3 lb for every cu yd of water over the rock. The object was not only to pulverize the rock but to move it sufficiently to obviate subsequent dredging.

The previous largest non-nuclear explosion involved 900 tons of low order nitrocarbonate blasting agent and cartridges of 60% dynamite to produce 2 million cu yd of fill for Southern Pacific Railroad's new causeway across Great Salt Lake, Utah (ENR Aug. 15, 1957, p. 28).

During the mining period within Ripple Rock, diamond drilling kept a good bit ahead of the heading to check earlier echo sounding made to locate the submerged peaks. The hogsbacks turned out to be much narrower than the survey ship indicated, as drillers repeatedly broke into the sea when they thought they still had 25 ft to go. The echo sounding device reflected gentle slopes with good accuracy, but failed to report the sharper topographical features.

Remotely controlled emergency gates were installed at each box-hole entry so that any or all of them could be isolated if excessive flow of water were encountered.

The big blast at Ripple Rock created a great deal of scientific interest. Data gathered from seismographic stations throughout western Canada will form part of Canada's contribution to the International Geophysical Year. Four rockets were shot up just before the blast so their white smoke could be photographed to measure air concussion. Remote controlled movie cameras were focused on tide gages in the area.

Rock was actually sprayed 500 ft into the air and over an area of 1,500 ft radius, but the bulk of it slipped relatively quietly into adjacent deep water as planned. All persons within three miles of the blast were evacuated and residents located within a five mile radius were warned to leave their windows open.

All dwellings within the three-mile range were photographed by the Canadian Department of Public Works to forestall unwarranted claims upon a $200,000 damage fund established for expected legitimate claims.

Jean-Paul Carriere directed the project for the federal government which retained Victor Dolmage and E. E. Mason of Vancouver, as consulting engineers. The mining work was performed by Northern Construction Co. and J. W. Stewart Ltd. jointly with Boyles Brothers Drilling Co. under a $2.6 million contract. DuPont Co. of Canada Ltd. supplied the explosive and the services of Mr. Bickel out of Wilmington, Del.

MAIN TUNNEL from 570 ft shaft on shore extends 2,000 ft to center of the underwater mountain.

EXPLOSIVE protected by watertight tins are stacked in 3x5 ft coyote drifts. Special primers were utilized.

Limited Access Scores

Safety on four-lane divided highways hinges on access

With controlled access, four-lane divided highways are almost four times as safe as other trunkline roads.

But without controlled access, the four-lane divided highway is the most accident prone and dangerous road.

These strong statements come out of a recent study of such roads in the state of Michigan—which, according to State Highway Commissioner John C. Mackie, will no longer "plan and design new four-lane divided highways without control of access," in view of the study.

The study indicates an accident rate averaging 151 accidents per 100 million vehicle miles on rural state trunkline expressways during 1957. This compares with 305 on four-lane divided highways without controlled access; and with a five-year average of 223 for all rural trunklines.

Fatality rate for the controlled access expressway during 1957 was 2.5 per 100 million miles and 5.0 for uncontrolled access. Five-year average for statewide trunkline was 8.2.

Commissioner Mackie, in an analysis of the disparity in rates, characterizes the four-lane divided highway without controlled access as giving the motorist a "false sense of security." He elaborates:

"They encourage travel at high speeds because they separate traffic and provide additional room for maneuverability, yet they still subject the motorist to friction from vehicles or pedestrians moving in and out of roadside services, business establishments and residences.

"They require stop lights at major intersections which vastly increase rear-end collision potential.

"They require left-turning movements in the face of oncoming high-speed traffic.

"In short, although they are capable of carrying a greater volume of traffic than a two-lane highway, they still expose the motorist to the same accident hazards, at a higher average rate of speed, as the obsolete two-lane roadways they were designed to improve upon or replace."

Budget Overboard

California budget drowned in bickering over water

A wrangle over California's water construction program has blocked legislative action on a $2 billion spending program for the fiscal year starting July 1. The deadlock has carried the legislature beyond its regular budget session and into a special session.

Members from the southern counties, in control of the Assembly (the lower house), want a permanent right to water imported from northern parts of the state. Without it, they refuse to spend "one cent" on actual construction of water projects in the water surplus areas of northern California. As a result the budget approved by the Assembly included an appropriation of $54 million only to continue engineering studies and land acquisition for the massive Feather River project in northern California, plus highway and railroad relocation work at the site of Oroville Dam.

In the Senate, dominated by northern counties, the Assembly's appropriation was fattened to $83 million.

On March 31 the regular budget session period ran out, leaving the budget high and dry for the first time in California's history. In calling a special session Gov. Goodwin J. Knight deplored the "legislative inability or unwillingness to compromise regional differences."

The governor's suggestion: Vote on the budget minus the water project appropriation and consider the latter separately. As a compromise water bill he proposed an appropriation of $74 million, which would give both groups a taste of victory. This sum would include $20 million for actual construction of water projects. Eliminated would be smaller developments serving local water needs and preliminary studies for new projects.

Failure Loss Shared

All parties to Canadian bridge collapse pay

An agreement has been reached over the reconstruction of the $135,000 triangular-framed water pipeline bridge that collapsed in Winnipeg, Canada, on Nov. 27, 1957, a few hours after the city waterworks department had turned on the water for tests (ENR Feb. 20, p. 24).

The $79,500 loss suffered by the collapse will be shared by all parties to the project: The City of Winnipeg, the owner; Dominion Bridge Co. Ltd. of Winnipeg, the contractor; and Templeton Engineering Co. and P. L. Pratley of Montreal who designed the bridge. Dominion Bridge Co. will bear $30,600, Mr. Pratley $13,500, Templeton Engineering Co. $10,950, and the City of Winnipeg $24,450.

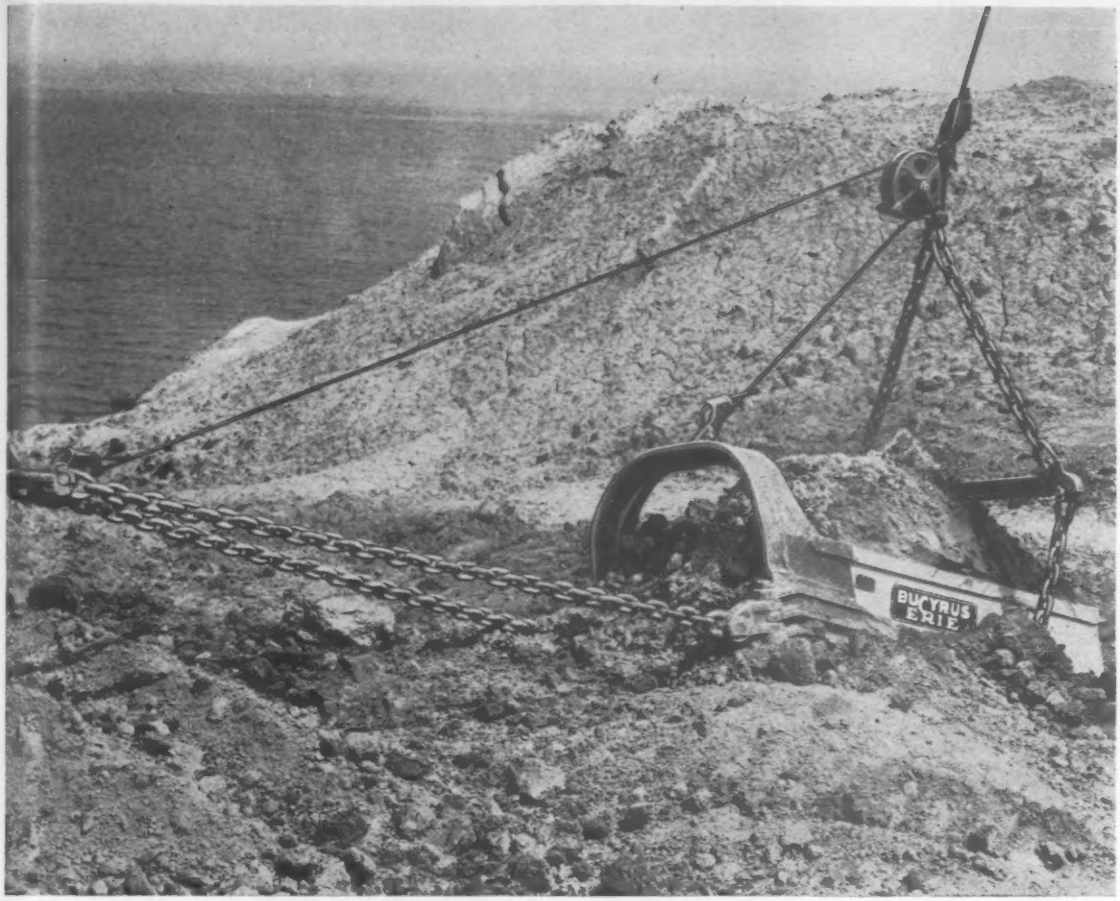
The report on the collapse presented to the Winnipeg City Council gave no indication why the bridge collapsed. It said: "It is generally conceded that the engineering matters are complex ones, and are going to be difficult to resolve."

A new bridge is to be erected by Dominion Bridge Co. and is to be completed by July 31, 1958. It will be a "conventional" bridge rather than the triangular truss type that collapsed.

The friendly settlement, which was approved by the Winnipeg City Council, will end all litigation that might have arisen out of the bridge's collapse. The city will spend an additional $5,600 as its contribution to the more expensive conventional type of bridge.

Grande Dixence Reaching Skyward Rapidly

Grande Dixence Dam in Switzerland, which will be the world's highest at 922 ft (dotted line), is getting up there fast. It is now two years ahead of schedule and construction work will probably be completed by 1965 (ENR May 24, 1956, p. 34). Water is now being impounded behind Grande Dixence. In testing the 13¼ ft dia outlet tunnels under 285 psi pressure it was noted that water loss along a five mile stretch was only ⅛ cfs. When pressure was reduced to 255 psi, water returned to the tunnel at the same rate.



Bucyrus-Erie buckets are accurately balanced so that "slicing-action" lip penetrates quickly. Basket is tapered to fill rapidly. It is correctly flared and balanced to carry cleanly; has smooth interior and high arch to dump fast.

Bucyrus-Erie buckets PROVE their toughness—

Handle many hundred thousand yards of dirt, sand, and gravel

Bucyrus-Erie buckets are given tough resistance to abrasion through use of the special lightweight alloy, BECOLOY. It *must* be tough, because it resists wear in buckets that handle many hundred thousand yards of dirt, sand and stone.

BECOLOY, used in teeth, lip and side castings, also has high impact resistance to take the bending and breaking forces that come with hard knocks. Field maintenance is simple, too. BECOLOY can be cut with an acetylene torch and welded without special procedures.

On top of longer life and lower upkeep, BECOLOY brings extra payloads. Buckets made of high-strength BECOLOY are lighter. You swing a load that *pays* a lot, not just *weighs* a lot.

Your Bucyrus-Erie distributor will help you choose the bucket that is best for your needs—from a wide range of sizes with solid or perforated baskets, in light, medium, and heavy-duty types. 43R58

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No New Bridge

Crossing considered as an unsound investment

The California Toll Bridge Authority has voted against construction of a bridge across the southern part of San Francisco Bay after receiving a report from financial consultants that investors would give the project a cool reception.

The long-debated project foundered on two principal objections of investors:

- That the 25 cent ceiling the California legislature set on passenger car tolls would not give bondholders enough protection.
- That current plans for increasing the vehicle capacity of existing bay crossings reduced the economic need for a new crossing.

Capacity of the San Francisco-Oakland Bay Bridge is to be enlarged by 35% as a result of a $35 million remodeling program soon to get under way. In addition, the legislature has authorized studies for a project that would double the capacity of the San Mateo-Hayward Bridge.

Bonds would be paid off with revenue from both the San Francisco-Oakland Bay Bridge and the new structure. However, a revenue study 1¼ years ago concluded that tolls on both bridges might have to be raised above 25 cents to meet obligations created by a new crossing. The project at that time was called "marginal as to financial feasibility" (ENR Nov. 15, 1956, p. 24).

The feasibility studies were conducted by Smith, Barney & Co., New York City financial consultants. In the latest study, the firm submitted traffic and cost reports to 28 investment banking companies that have played a major role in financing vehicle toll facilities now in existence in the U.S.

The 28 were asked for reactions to two proposals: a $250 million bond issue for financing construction of the entire bridge, including approaches; a $180 million bond issue to finance a "minimum" project, waiving approaches to be financed separately at a later date. The authority had in mind a 50-year issue with an interest of 4¼%. Response by the 23 investors replying to the questionnaire was 100% unfavorable to the $250 million bond proposal. Two firms indicated an interest in the $180 million plan, but the rest were unimpressed. A few in the majority said they might change their minds if the interest rate were raised or the project made more attractive in some other way.

C. Cheever Hardwick, a partner at Smith, Barney, said that to raise the interest rate might make the project even more "marginal" than it was at the original rate and would delay its completion. He also added, that the investors had further objections to the bridge proposal. Investors—particularly institutional investors—have had unhappy experiences with motor vehicle toll facilities built in the U.S. in recent years, he said. Because traffic frequently falls below expectations, earning records have been disappointing. Moreover, on some projects construction costs substantially exceeded estimates.

Mr. Hardwick also warned the authority about the dangers of two-stage financing; when the time for the second issue arrives the bond market might be more unfavorable or construction costs higher.

The authority's decision against the project was on a 4 to 1 vote, with Lieut. Gov. Harold J. Powers dissenting. The body decided to meet again in a month and discuss alternate plans for another Bay bridge.

Traffic studies for the rejected "southern crossing" bridge were by Coverdale & Colpitts, New York City, and a cost study was prepared by the Department of Public Works' Division of Toll Crossings.

Tight Specs at Oahe

Powerhouse substructure bidders must cope with earth rebound, slides

Oahe Dam's tricky and faulted Pierre shale formation, with its predisposition to slide and its characteristic of rebounding when overburden is stripped made for the tough construction contained in a bid call for the powerhouse substructure last week.

Bids on the big Missouri River job, expected to be in the $5 million class, will be opened May 15 by the Omaha District of Army Engineers. The project involves 38 ft deep excavation and the placing of concrete monoliths in thicknesses up to 33 ft. This substructure will support a powerhouse 532x117 ft and a service bay which together will be South Dakota's largest building.

The stringent specifications represent lessons learned in the spilling basin, where rebound was as much as two feet, and in powerhouse area excavation, where slides necessitated cutting the slopes back to a grade of one on 10, thereby requiring removal of an extra four or five million cu yd of material.

The contractor will be permitted to remove dirt for no more than two generator bays at a time; excavations must be separated by an area equivalent to at least two generator bays. The portion left intact is designed to serve as a buttress to prevent slides.

Specifications require that the shale be covered with a 1 ft thick concrete slab within 48 hours after final grade has been reached. This is to prevent disintegration of the surface. Immediately thereafter, the shale must be tied down to prevent rebound. This will be accomplished by setting 20 ft lengths of No. 11 bars in 6 in. holes, belling out the bottom and filling the holes with grout. Thereafter, the rods will be bolted to hold the ground in place. The rods are to be placed on 5 ft centers with such additional bars as field observation dictates. In all, there will be more than 3,000 "earth" bolts.

By going ahead with the substructure while the powerhouse superstructure is still being designed, Army Engineers estimate nearly a year will be saved in bringing power on the line at the South Dakota dam.

Cooperative Computer

Seven small consultants form computer center

Early this month what is believed to be the first electronic computer center formed on a "co-op" basis by civil engineering users opened in Decatur, Ill.

Seven smaller consulting engineering firms, all located within a 100 mile radius of Decatur, have subscribed equally to stock in the new center, which is known as Midwest Computer Service, Inc. Each firm also has agreed to buy enough time on the machine to assure the first year's operations.

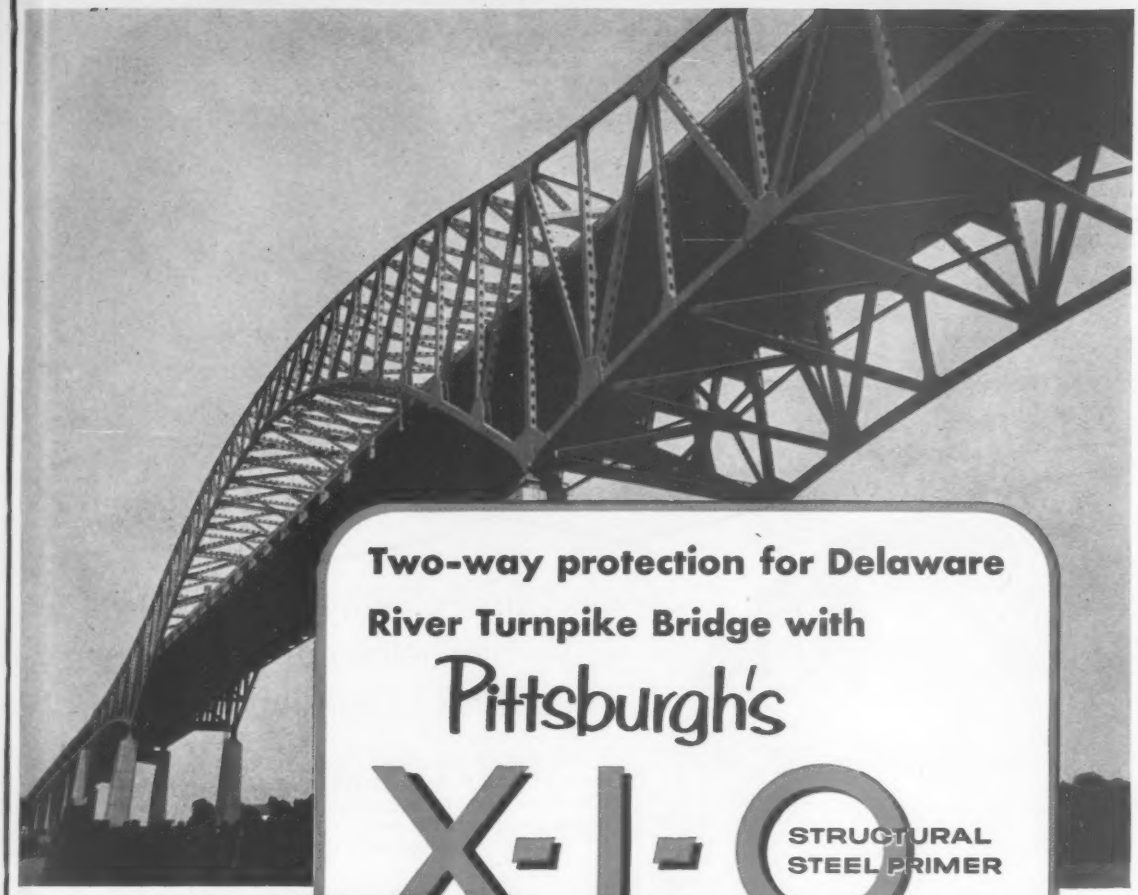
Initially, the service center will be available only to the owners' firms, but nearby industries are to be accommodated as soon as possible.

How the service center came to be formed is explained by its president, E. M. Chastain, partner of Homer L. Chastain & Associates, Decatur: "For the smaller engineer, the situation has reached the point where it's a matter of get a computer or get out of the race. We saw we needed a computer, but we didn't have enough work for full-time use of one. We then got the idea of forming a corporation with other firms as participating members."

The other member firms are Crawford, Murphy & Tilly, Springfield; Jenkins, Merchant & Nankivil, Springfield; Rochester & Goodell Engineers, Inc., Salem; Hurst-Dosche, Inc., Hillsboro; Clark, Daily & Dietz, Urbana; and Warren & Van Praag, Inc., Decatur.

Midwest Computer Service now is equipped with a small programming staff and a rented Bendix G-15D electronic computer.

Commenting on the new organization, L. R. Schureman, a Bureau of Public Roads electronic computer expert, said: "I think a computer center on a cooperative basis is the answer to the small engineer's problem."



Two-way protection for Delaware River Turnpike Bridge with Pittsburgh's X-L-O STRUCTURAL STEEL PRIMER

1. Safeguards steel shapes against corrosion during erection

2. Serves as excellent foundation coat for field painting

Excellent example of the importance of the double protection against corrosion which Pittsburgh X-L-O Primer gives to structural steel is the $14,000,000 bridge which links the Pennsylvania and New Jersey Turnpikes. This is a six-lane viaduct, composed of 31 steel spans. Its main continuous truss structure is one of the heaviest of its type in the United States. Designer of this huge bridge was George S. Richardson, of Pittsburgh, Pa. All structural steel was fabricated and erected by the American Bridge Division, United States Steel Corporation.

● **Structural shapes** for this bridge were shopcoated with Pittsburgh X-L-O Primer. This protected them against corrosion during transit and erection. It eliminated necessity of costly metal cleaning and provided uniform coverage, even over surface irregularities caused by mill scale. Thorough drying within twenty-four hours permitted prompt shipment to the job site, regardless of weather. X-L-O Primer also served as an excellent foundation for final coating.

● **Our wide experience** in supplying protective finishes for structural steel shapes of all kinds can save you time and money. Call, wire or write us for further information about X-L-O Primer or IRONHIDE and METALHIDE for field coating. Pittsburgh Plate Glass Company, Industrial Paint Division, 1 Gateway Center, Pittsburgh, Pa.

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75th ANNIVERSARY 1883—1958 PPG

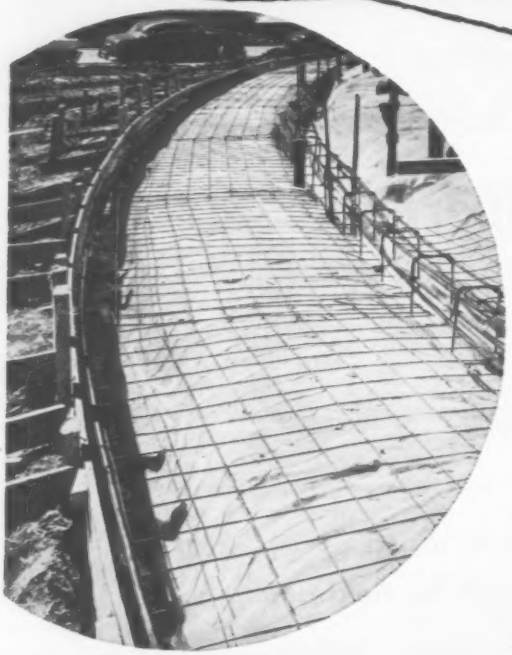
PITTSBURGH PLATE GLASS COMPANY

IN CANADA: CANADIAN PITTSBURGH INDUSTRIES LIMITED

Mr. T. F. Glass, Jr., President of the Houston contracting and engineering firm of Spaw-Glass, Inc., was responsible for the construction of the Shamrock-Hilton's new poolside lanai.

1,000 square feet of .004" thickness Olin Polyethylene film weigh less than twenty pounds. Light weight cuts time and labor.

BUILDERS! Here's a great new time saver!



Olin Polyethylene comes in a wide variety of roll sizes, specifically designed to fit builders' needs.

Olin Polyethylene moisture barrier helps contractor keep Shamrock-Hilton job on schedule

T. F. Glass, Jr., President of Spaw-Glass, Inc., knew the construction of the Shamrock-Hilton's new 44-unit lanai presented difficulties. Beautiful in conception and design, Spaw-Glass' workmanship had to be the finest. Yet time was all-important. Needed for the hotel's summer season, the job had to be completed in only 110 days!

"We decided from the beginning to use Olin Polyethylene," says Mr. Glass. "Our experience with it had shown us we could save time and labor – that's money in the bank. Olin Polyethylene in .004" thickness would also give us a superior seal against moisture – better, in our opinion, than felt and tar. We knew Olin Polyethylene was impervious to moisture, and practically indestructible once in place.

"Not only was it light and easy to handle, but it saved us the time and cost of tarring. The fact that it comes in a wide variety of roll widths also helped cut time and labor. Through use of Olin Polyethylene, we were able to save a whole day. Believe me, it came in mighty handy!"

Why not give yourself the same time and cost advantages Olin Polyethylene has already brought leading builders the country over? Unaffected by most acids, alkalies, bacteria, mold and temperature changes, multi-use Olin Polyethylene makes a permanent moisture, vapor and draft barrier. For more information and a free booklet describing its many varied uses, write: Film Division, Olin Mathieson Chemical Corporation, 655 Madison Avenue, New York 21, New York.

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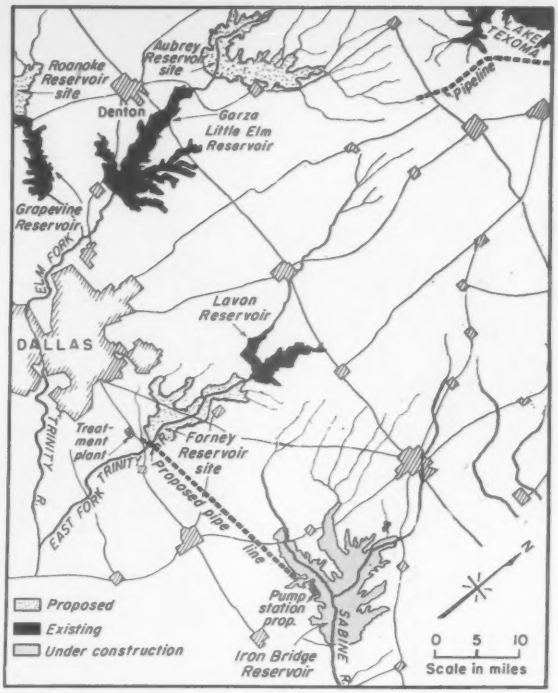
ENR-48

Caught short of water during the recent drought in the Southwest, Dallas, Tex., is making sure the situation never repeats by developing a source good through the 1980s and planning future reservoirs through the year 2000 (see map).



Water Scheme Assures City's Growth

It is not likely that bottled drinking water will ever again be sold on the streets of Dallas, Tex., as happened a couple of summers ago during the big drought. For this booming city is not only thinking big in connection with future water supply, but is building big.

Construction is getting under way on a $15.5 million reservoir that will supply Dallas' needs into the 1980s. Blueprints have been drawn for the necessary pumping, pipeline and treatment facilities to bring the water to the city. And the sources to supply the metropolis' needs to the year 2000 and beyond have been pinpointed.

The current project is Iron Bridge Dam on the Sabine River about 50 miles southeast of the city for which a $4.3 million contract for an earth embankment and concrete spillway was awarded late last year.

When completed in 1960 the rolled fill dam and concrete spillway, with a total length of 29,900 ft and a maximum height of 85 ft, will have a total storage capacity of 1,260,000 acre-ft. Of this amount, 897,000 acre-ft will be for water conservation, providing an annual reservoir yield of 200 mgd.

The $15.5 million project is being built by the Sabine River Authority, under a contract agreement with Dallas. The city will pay all costs of constructing the dam, including the cost of land for developing reservoir site. In return, Dallas will get 80% of the water yield from the reservoir, or 160 mgd.

To get the project started, the Sabine River Authority issued $5 million of revenue bonds. Dallas is obligated to pay the principal and interest on these bonds, and will provide up to an additional $15 million when needed.

• **13 bidders**—A joint venture of Moorman, Dewitt and Singleton, and Whittle Contracting Co., of Fort Worth and Dallas, won the embankment and spillway from 12 other bidders. Low bid of $4.3 million was 5% below the second low bid, and well below the engineers' estimate of $5.4 million.

Major contract items include 5.0 million cu yd of borrow, at 23.5 cents per cu yd; 4.8 million cu yd of compacted fill at 6 cents; 800,000 cu yd common excavation and 100,00 cu yd of shale, at 33.5 cents and a new $50,000 highway bridge below the dam.

• **Closure in 1960**—Closure of Iron Bridge Dam, to be made during low water in the summer of 1960, will be a relatively simple operation. As indicated in an accompanying illustration, the main embankment will be extended out from both sides until to within 150 ft of the previously excavated open diversion channel.

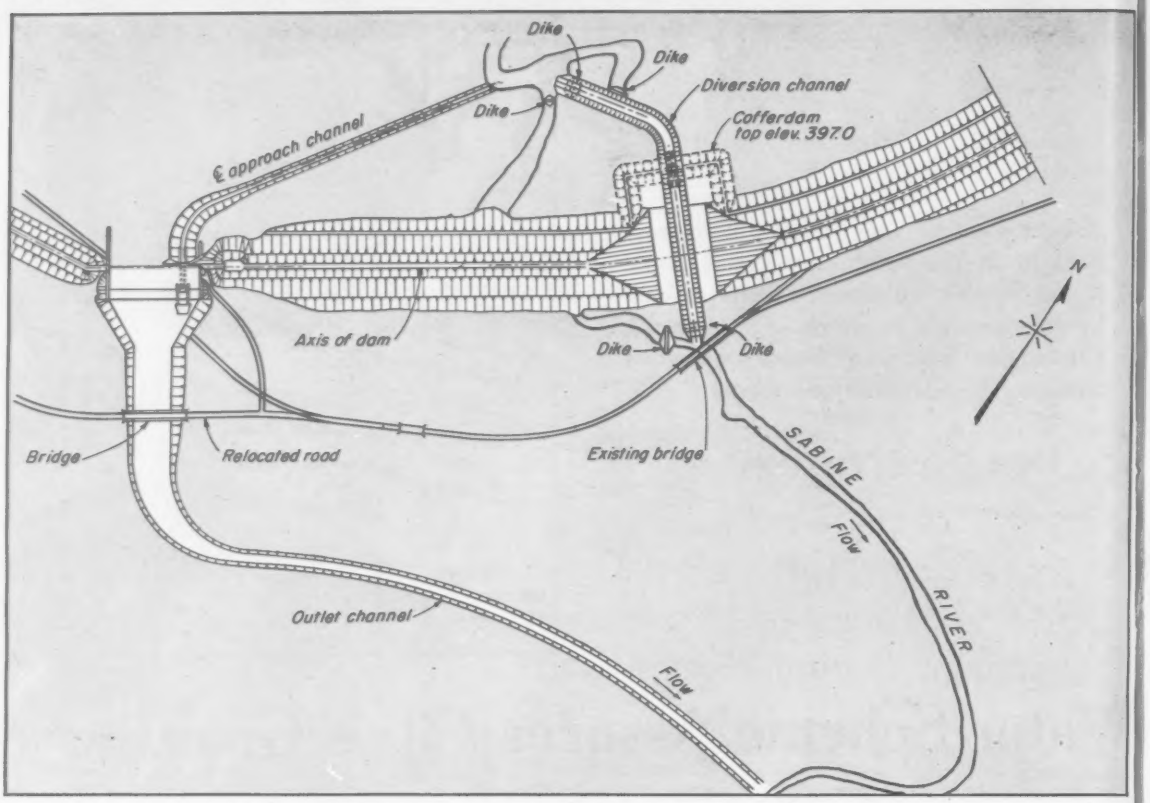
A relief channel will then be dug from a point in the river about 1,000 ft above the axis of the dam to the outlet works in the spillway. This will divert the flow of the main channel away from the closure section and through the sluiceway of the spillway.

An earthfill cofferdam will then be constructed on the upstream side of the diversion channel, extended about 300 ft upstream and cross the diversion channel. With the diversion channel plugged and the area sealed off by the cofferdam, closure of the main embankment can be made in the dry.

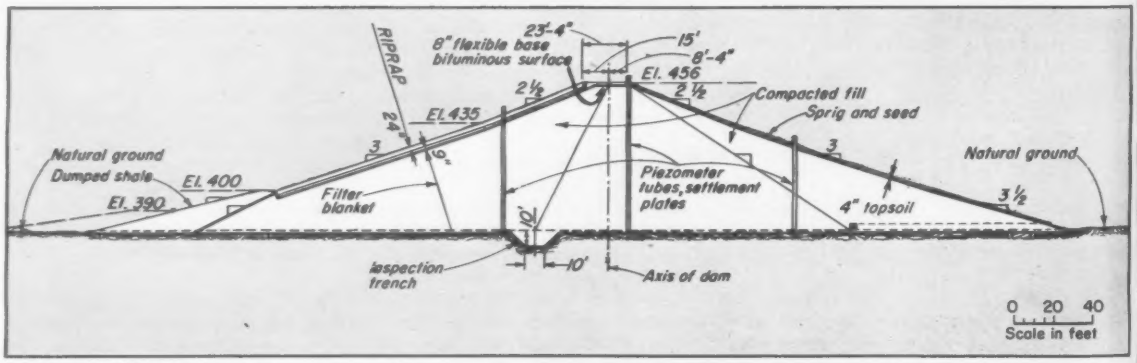
• **Present water supply**—At present city water storage in Grapevine Reservoir and Garza-Little Elm Reservoir furnishes a safe combined yield of 120 mgd. In addition, Dallas contracts with the North Texas Municipal Water District to buy 10 mgd maximum of filtered water delivered at the city limits. This water comes from Lavon Reservoir about 25 miles northeast of the city.

Grapevine and Garza-Little Elm, finished by the Corps of Engineers in 1952 and 1954 respectively, could not be filled because of the seven-year drought that ended with last spring's floods. But now with both reservoirs practically at their total 500,000 acre-ft capacity, plus the 10 mgd of Lavon Reservoir water, Dallas is assured a safe

. . . Construction is getting under way at Iron Bridge Dam



LAYOUT OF SPILLWAY AND CLOSURE of Iron Bridge Dam to be made in 1960. Structure will be 29,900 ft. long.



ROLLED FILL EMBANKMENT will be maximum of 85 ft high with careful provision made to record settlement and uplift pressure.

yield of 130 mgd. By comparison, the city's average daily pumpage is 85 mgd, while its peak demand last summer was 160 mgd. At present Dallas supplies water to about 640,000 people.

It might appear that the city could take a breather in developing more water supply. Just the opposite is true. The suburban areas served by the Dallas water department are growing so rapidly that water demands will just about reach the safe yield of its present reservoirs by 1963.

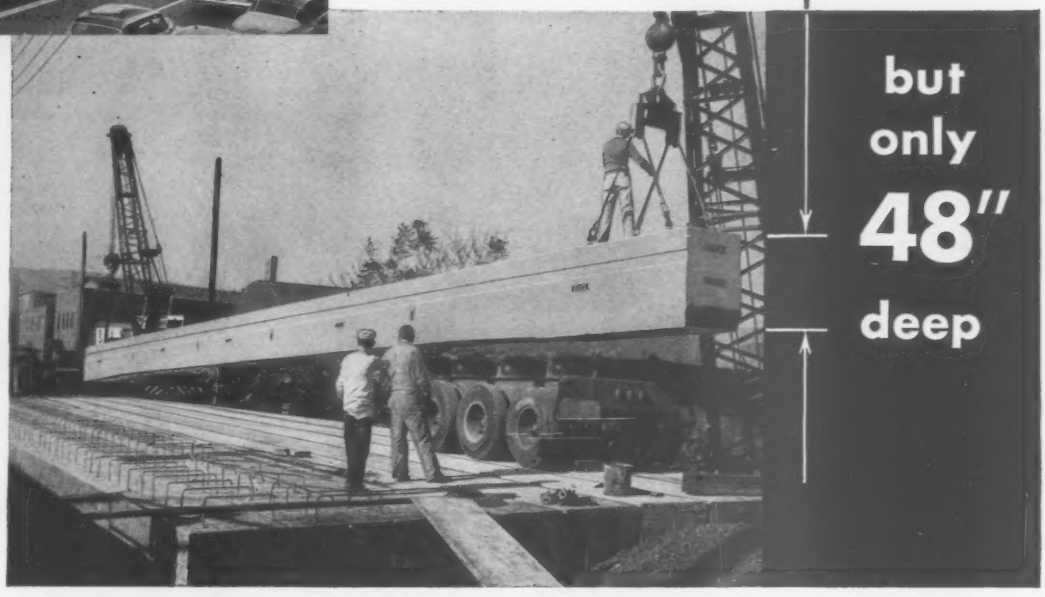
• **Long-range plan**—In taking a broad look at its future water requirements, Dallas water department engineers and consultants, have developed long-range plans to the year 2000.

Iron Bridge Reservoir, with its estimated yield of 160 mgd, together with the 130 mgd now available, will give Dallas a total supply of 290 mgd. This should meet the needs of the city until 1982 at which time it will be serving an estimated 1.4 million persons including surrounding urban areas.

• **Forney Dam**—In addition, the city expects to start first stage construction of Forney Dam on the East Fork of the Trinity River by 1965 to help meet summer peak demands. The reservoir's full yield of 72 mgd should provide Dallas enough storage to meet its water requirements through 1890.

It is planned to get additional storage facilities under way around 1982 as part of the master plan of development for the year 2000 at which time the total population expected to be served by the

Over 100 feet long...



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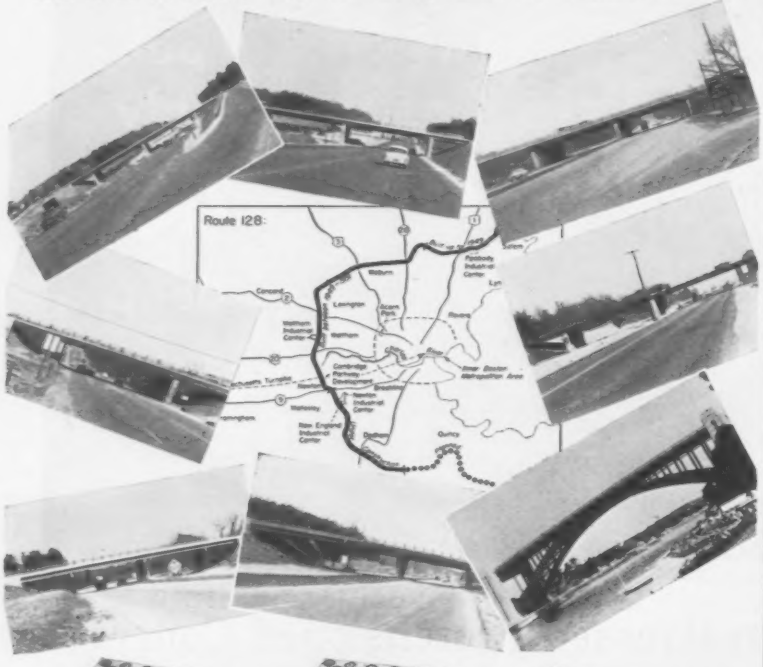
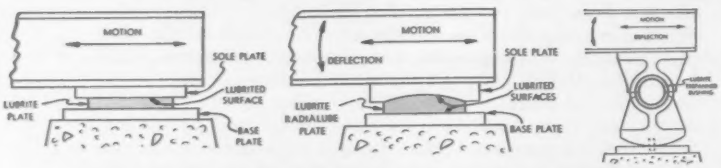


3 BASIC LUBRITE ASSEMBLIES



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. . . Dallas water scheme

Dallas water department will be about 2.25 million.

• **Future dams**—Two projects would be developed on Elm Fork and Denton Creek above present reservoirs to increase their total yield. One is Aubrey Dam above Garza-Little Elm. The other is Roanoke Dam, above Grapevine.

Both dams will be rolled fill embankments with concrete spillways. Aubrey would be about 14,450 ft long, with a maximum height of 127 ft and an uncontrolled, gravity-type weir spillway. Estimated to cost about $19.5 million it would have a reservoir yield of about 100 mgd. This yield is based on providing 238,000 acre-ft of flood storage in Aubrey Reservoir in exchange for 218,000 acre-ft of conservation storage in the Corps of Engineers' Garza-Little Elm Reservoir, a short distance downstream.

Roanoke Dam would be about 13,850 ft long and 96 ft high, with a gated concrete gravity weir. The $11 million project will be designed for a reservoir yield of 30 mgd, based on providing 207,000 acre-ft of flood storage in exchange for equivalent conservation storage in Grapevine Reservoir.

• **Additional facilities**—Construction of Iron Bridge Dam is only part of the development plans to provide Dallas with additional Sabine River water by 1963. Other facilities now being planned include a pumping station just below the dam, a new water treatment plant east of the city and a 35 mile, 72 in. dia raw water supply line between the pumping plant and the filtration plant.

The pumping station will have an installed capacity of 160 mgd. A second 72 in. raw water line will be installed eventually between pumping plant and filter plant, and the two lines will have a combined hydraulic capacity of 150 mgd.

No starting date or construction timetable has been set for the pumping plant, raw water line, or the filtration plant, but all three should be finished by 1963.

This part of the program also includes about 16 miles of 72 in. to 96 in. filtered water line from the new plant to a 25 mg reservoir on the south side of Dallas.

• **East Side plant**—At present Dallas has two filtration plants. They are the original 100 mgd Bachman plant on the west side of the city, and Elm Fork plant northwest of the city which was completed in 1951 (ENR May 3, 1951, p. 35) and has a rated capacity of 100 mgd.

(*Continued on page 39*)

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ERECTED WITHOUT special skilled help. Gilbert's crew constructed the complete plant under the supervision of Construction Equipment Company, local Blaw-Knox distributor. Simplified components saved two weeks' time, Gilbert estimates. Plant is rated at 100 yards-per-hour.

"Dollar-for-dollar I got the best value from Blaw-Knox"

"These units were selected after careful survey and analysis. They combined a variety of features to provide the best dollar-value of any equipment we looked at," says J. M. Gilbert, President and General Manager of Concrete Materials, Inc. of Decatur, Alabama.

Concrete Materials, Inc. owns a Blaw-Knox Ready-Mix Operator's package—three 5½-yard Hi-boy Truck Mixers and a one-stop Concrete Batch Plant. And, like Ready-Mix Operators everywhere, Concrete Materials, Inc. is in business to stay, with high output, precision-engineered Blaw-Knox Equipment. See your Blaw-Knox distributor for helpful ideas on how the proper equipment leads to bigger profits.

¾" SLUMP concrete is regularly handled by the Hi-boys. Gilbert produces air entrained concrete with low water content. He mixes only 15 gallons of water per yard of low slump concrete. Heavy Manten steel in the Hi-boy drum and blades withstand the punishment of harsh stone aggregates used exclusively.

"MANEUVERABILITY is important," Gilbert says, "since we frequently must get through tight areas around buildings, stacks of material and the like. Overall dimensions of the truck and mixer are 18-inches shorter and 3-inches lower because of the Hi-boy design." Since beginning operations early last year maintenance on the equipment has consisted only of routine lubrication.

BLAW-KNOX

BLAW-KNOX COMPANY

Construction Equipment Division

41 Charleston Avenue, Mattoon, Illinois

. . . Dallas water scheme

The proposed East Side plant will have an ultimate capacity of 250 mgd at a rate of 2 gpm per sq ft of filter area, with a maximum 100% overload factor to meet peak demands.

It is proposed to build the plant in three stages: 50 mgd for the initial stage by 1963, then increased to 150 mgd and ultimately to 250 mgd. The pumping plant also will be built in stages.

By 1963 Dallas will have a maximum filtration capacity of 350 mgd in its three plants. Stage 1 of the East Side plant will be rated for 100 mgd at 4 gpm per sq ft. The Bachman plant will produce 100 mgd, while the expansion of treatment facilities now under way at the Elm Fork plant will increase its capacity to 150 mgd.

• **Method of treatment**—The East Side treatment plant will be a lime softening plant with ferric sulphate coagulation; carbon for taste and odor control; chlorine for sterilization; and ammonia for chloramine control.

Preliminary plans for the first stage construction of the plant include a filter building with 16 filter beds of 3.33 mgd capacity each, at a rate of 2 gpm per sq ft. The chemical building will probably include two 500 ton bulk lime storage tanks; three 150 ton bulk ferric sulphate tanks; 150 ton bulk alum tank and underground storage for 60 tons of bulk carbon, in railroad cars. Three bulk conveyor systems will be needed to handle lime, ferric sulphate, and alum. Other treating facilities will include two 4,000 lb per hr and two 2,000 lb per hr lime feeders and slakers; four 1,200 lb per hr primary coagulant feeders; and four secondary coagulant feeders of 1,200 lb per hr capacity each. Two 8,000 lb evaporators will be needed for chlorine and two 1,200 lb evaporators for ammonia together with two 2,000 lb per day chlorinators and four 120 lb per day ammoniators.

Settling basins include two primary units with a total of 4 hr 45 min detention and two secondary units with 4 hr detention based on a 50 mgd plant capacity. Flocculators will have two primary units with 45 min detention and two secondary units with about 23 min detention.

• **High service pumps**—Preliminary plans for high service pumping equipment include two 25 mgd pumps and two 40 mgd under a 65 ft head and operated by 350 hp and 600 hp motors, respectively.

One reason for locating the East Side filtration plant in the eastern part of Dallas County is to take care of the rapid growth in population to the south

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. . . Dallas water scheme

and east of Dallas. To continue to serve these areas by the Bachman and Elm Forks plants imposes a tremendous load on the present distribution system since both plants are located on the opposite side of the city.

It is anticipated that eventually the two existing treatment plants will serve roughly the north half of Dallas County and the proposed East Side plant will serve the south half.

Henry J. Graeser is superintendent of the Dallas water department. Forrest & Cotton, consulting engineers of Dallas, designed Iron Bridge Dam and is supervising construction. As consultants for the city, this firm also is designing the pumping plant at the dam, the East Side treatment plant and the 35 mile raw water line.

Under present plans, none of the city's present water supply will be treated in the East Side plant. It will treat the water only from Iron Bridge Reservoir and other storage reservoirs to be built in the future in that area, such as Forney Reservoir.

MacDonald Memorial

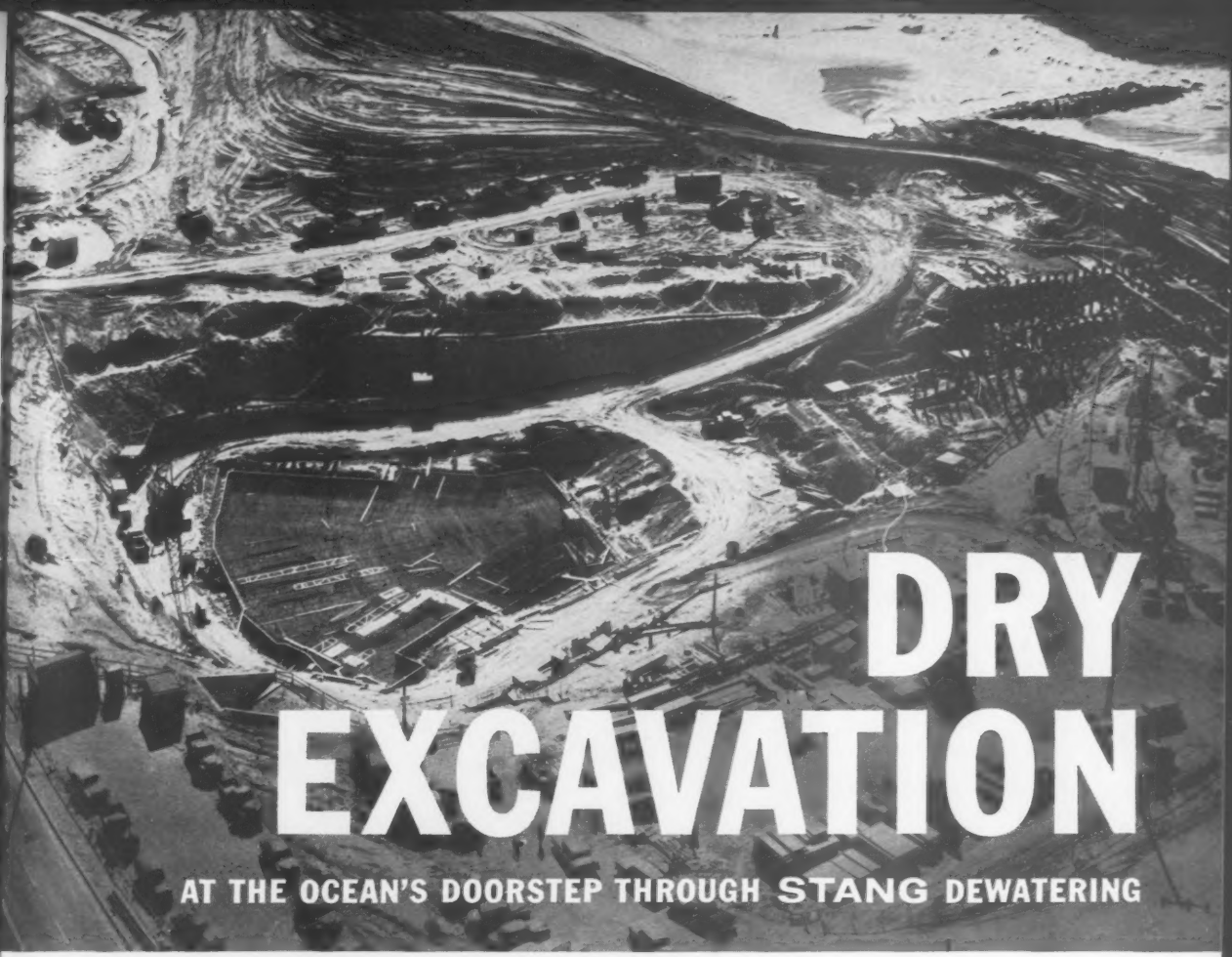
Sums are being raised for Transportation chair

A campaign to raise $1 million to establish a Chair of Transportation at Texas A. & M. College as a permanent memorial to the late Thomas H. MacDonald, for 34 years the nation's top highway administrator, got under way last week on the first anniversary of his death.

After his retirement as Commissioner of Public Roads in 1953, Mr. MacDonald, who is generally regarded as the man who contributed more than any other to the creation and development of our present national network of roads, began a transportation research program at Texas A. & M. The Memorial Chair provides for extension of the work he had been carrying on for four years in the college's Transportation Institute, which had been founded with his counsel.

The Chair is to be filled by a teacher selected for broad experience and for high qualities of wisdom and vision similar to those of Mr. MacDonald. Using institute facilities, the work will cover all transportation fields, with the aim of providing benefits to public officials, industry and transportation users.

Gifts to the Memorial Fund can be made direct to Texas A. & M. College or through a committee with headquarters in the Ring Building, Washington, D. C., which is headed by Pyke Johnson, consultant to the Automotive Safety Foundation.



DRY EXCAVATION

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PICTURED ABOVE: The Scattergood Steam Plant, in Southern California, on the edge of the Pacific Ocean. The excavation, made in beach sand, measured approximately 300′ x 100′ at sub-grade, with a maximum cut in the deep section of 32′ below the water table.

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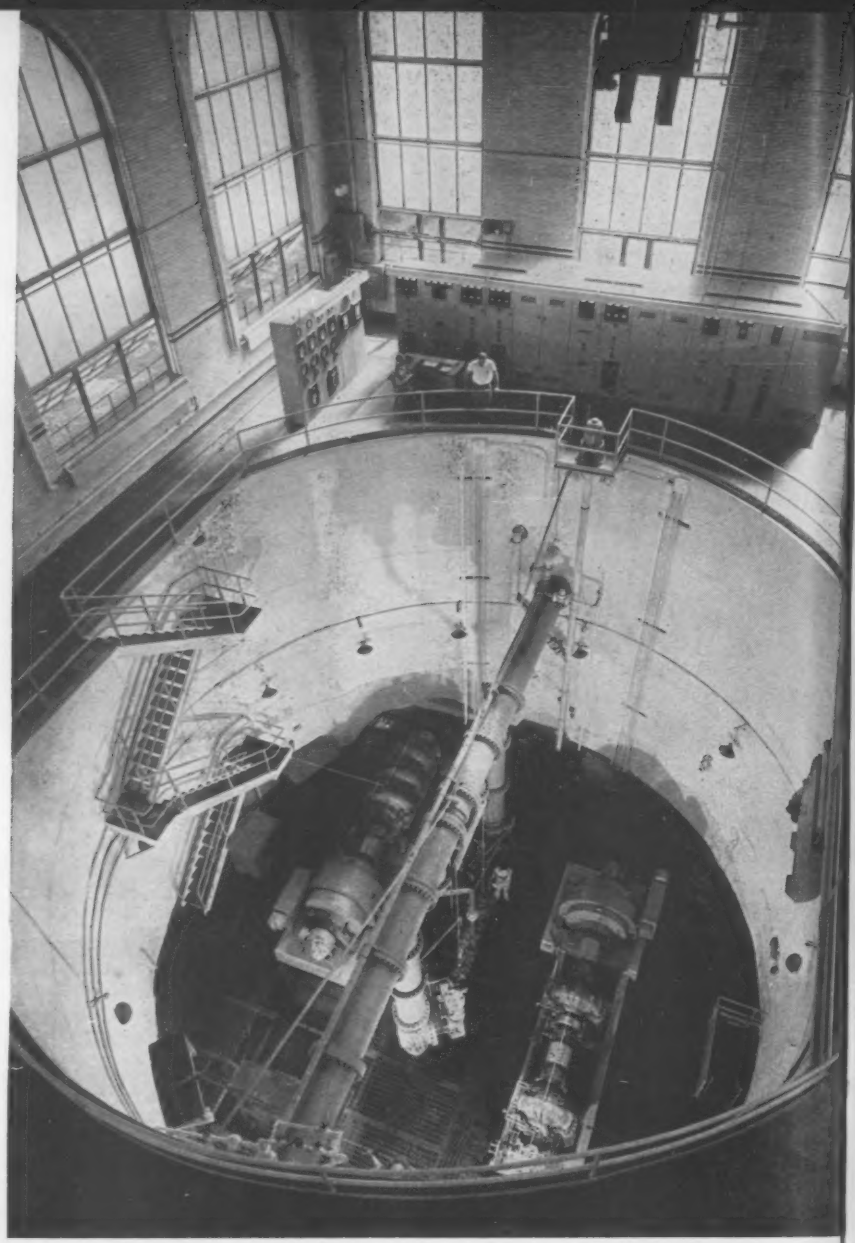
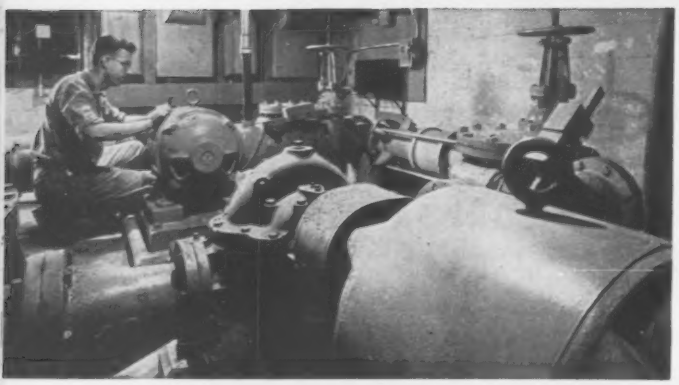
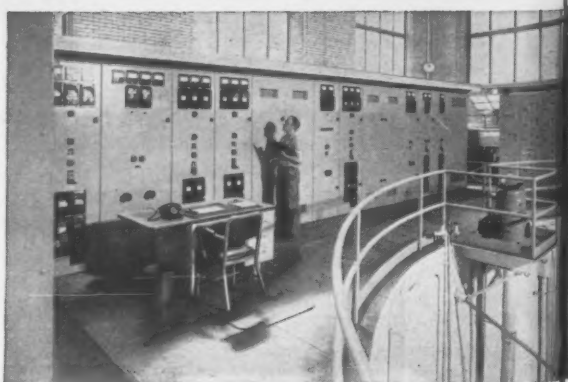


View at Nadine Pumping Station shows south pump pit containing pumps No. 2 and No. 3 with Westinghouse metal-clad switchgear and control center for all station pump motors in background.



Close-up view in booster station shows two 40-hp Westinghouse motor-driven booster pumps, Westinghouse safety switches, motor starters and power factor correction capacitor.



Metal-clad switchgear includes: incoming line section; starting breakers for 1000- and 1250-hp synchronous motors and their auxiliary field control cubicles; starting and running breakers and reactors for two 2500-hp motors.

Water pumping station saves $66,500 annually by Powering-Up electrically

The need for extensive modernization and expansion of water pumping facilities at Nadine Pumping Station of The Wilkinsburg-Penn Joint Water Authority brought about a complete change from steam to electric motor-driven pumps. One new 6.5-mgd pump was added to the three already in use to increase total capacity to 52,000,000 gallons per day.

In addition to the benefits of increased capacity and complete station electrification, comparative figures show a reduction in annual operating costs from approximately $268,000 to $201,500, for a savings of $66,500 per year. This represents an annual return of about 19% on the modernization cost of approximately $350,000. This fast five-year amortization of the investment eliminated the necessity of bond issues or other financing.

Besides the four new pump motors supplied by Westinghouse, the station now contains a line-up of 5-kv metal-clad switchgear, a 150-kva dry-type power center transformer, a motor control center for auxiliary power and a station battery and automatic battery charger.

The electrical Powering-Up of this pumping station has also made possible a more flexible discharge piping arrangement and the electric operation of valves and other equipment.

Powering-Up electrically can mean similar important benefits and savings for you. For further information, call the Westinghouse electrical construction engineer nearest you. He can help you in your Power-Up program. Westinghouse Electric Corporation, Box 868, Pittsburgh 30, Pa.

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Consulting Engineers: Morris Knowles, Incorporated
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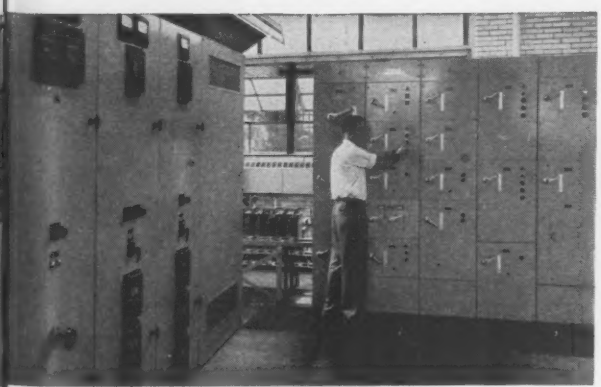

Shown at left is metal-clad switchgear feeder cubicle and 150-kva dry-type transformer. Motor control center at right contains motor starters and feeder breakers for various station auxiliaries.

Engineering group shown includes: George A. Maibach, Chief Engineer, Nadine Pumping Station; G. V. Gustafson, Morris Knowles, Inc., Consulting Engineers; M. B. Trimble, Westinghouse Construction Sales Engineer.

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For Timed Selling to the Construction Industry

CORRUGATED CONCRETE SHELL roof of Paris exposition hall begins to take shape on a forest of tubular steel falsework. Abutments at the corners will be its only support. Avenue de la Division Leclerc in foreground, Avenue Perronet beneath the trees in the background.

Paris presents . . .

The World's Biggest Thin Shell Roof

Spanning 720 ft in a vault with a rise of 152 ft, it will cover a huge industrial exposition hall

To her titles of Tourist Capital, Leader in Haute Couture and Art Mecca, Paris now aspires to add that of World Center of Industrial Expositions and Scientific and Engineering Congresses. And to give wings to this aspiration, French industry has joined to build such an eye-opening exposition palace, both in size and technical concept, that it should be a powerful lodestone. To be completed sometime this year, the exposition building will then be supplemented by congress halls of a size to cope with the needs of any of the world's scienitfic organizations.

Covering a triangle of 5.5 acres, the exposition palace is distinguished by a concrete shell roof, which will span 720 ft between supports at the corners of the triangle to double the world's record span for this type of construction. In appearance like the "big top" of a circus, the roof resembles a tent in actuality since it is entirely separate structurally from the multi-floored reinforced concrete building beneath it.

Rising 168 ft above the ground (152 ft above its springing line) at the Place de la Defense, a mile directly west of the Arc de Triomphe, the roof will add a new and modernistic note to a skyline made famous by the Eiffel Tower, the Cathedral of Notre Dame and the Church of the Sacre Coeur. And while the roof is the outstanding feature of the building, the principal floor is also structurally noteworthy, being composed of precast triangular panels assembled into a slab with the aid of prestressed wires.

Nearly every branch of French industry is represented in the Centre National des Industries et des Techniques, the organization that was formed to build and operate the exposition facilities. The architectural firm of Camelot, de Mailly and Zehrfuss developed the design, which was adopted in preference to a number of others (including one submitted by Pier-Luigi Nervi of Italy and another by E. Freyssinet of France, both famous for their bold innovations in concrete). And a contractor group known as SOCODEF, made up of Entreprises Boussiron, Constructions Ed. Coignet and Entreprises Balency & Schuhl collaborated in the design, and is now engaged in the construction.

• **General layout**—The triangular building has two principal floors, one at ground level (El. 163 ft), the other 40 ft higher (El. 203). Also along each of the three sides of the structure are rectangular four-story tier-type buildings, whose floors serve as mezzanines for the main floor. Together these three buildings may be said to constitute one of four separate structural systems into which the exposition palace is divided. A second separate system is the central triangular part of the floor at El. 203 and its supporting columns, a third is represented by the three areas at the corners of the building, while the fourth is the roof and its three abutments.

Since the site has a slight slope, the street on one side (Ave de la Division-Leclerc) is at the ground floor level, while the street on another side (Ave Perronet), a two-block-long prolongation of the famous Champs Elysees, is at the higher floor level (El. 203). The third side is bordered by the rail line to Versailles.

The principal entrances to the buildings are placed on the two street sides, an arrangement that will permit two different expositions to be held on the two principal floors simultaneously and without conflict. As a matter of fact several smaller expositions could also be held at the same time on the mezzanine floors.

Access for trucks is provided at both main floor levels so that exhibits can be delivered easily. The building will also be served by a railroad freight siding. Finally, in the ultimate layout, Ave Perronet, which now ends at the rail line, will be depressed to pass under it as part of a new highway route, and a vast elevated pedestrian plaza will be built over the avenue at the entrance level, El 203.

(Continued on page 46)

. . . Exposition palace

The floor area of the building totals a little over one million square feet, of which 130,600 sq ft is occupied by offices, restaurants and other service facilities. Six sets of stairs and elevators join the various levels, and the two main floors are connected by moving stairs.

The tier type buildings, which contain a total of 575,000 sq ft of floor and roof surface on four levels, are partly under and partly outside of the shell roof, and entirely separate structurally from the rest of the structure as may be seen on an accompanying drawing. They are principally notable for being almost entirely built of precast members of somewhat uncommon makeup. Thus, the columns, for example, are composed of three elements —a rectangular shaped core between end pieces in the form of half cylinders. In overall dimensions the columns are 20 in. wide and 5 ft long.

These columns are spaced 30 ft apart lengthwise of the buildings and 40 and 45 ft transversely. Beams are used only in the longer dimension, providing support for precast floor panels which span in the other direction. These floor panels, weighing 4.2 tons each, are flanged elements 5 ft wide and 30 ft long, equipped with 20 in. deep flanges. As for the beams, only the lower half is precast—in a U-shaped section 20 in. wide and 20 in. deep, which weighs about 6 tons. The flanged ends of the floor panels rest on the legs of the U, and the wide joint thus created is filled with concrete to complete the 40 in. deep beam. The floors of these tier type buildings are designed for a live load of 110 psf.

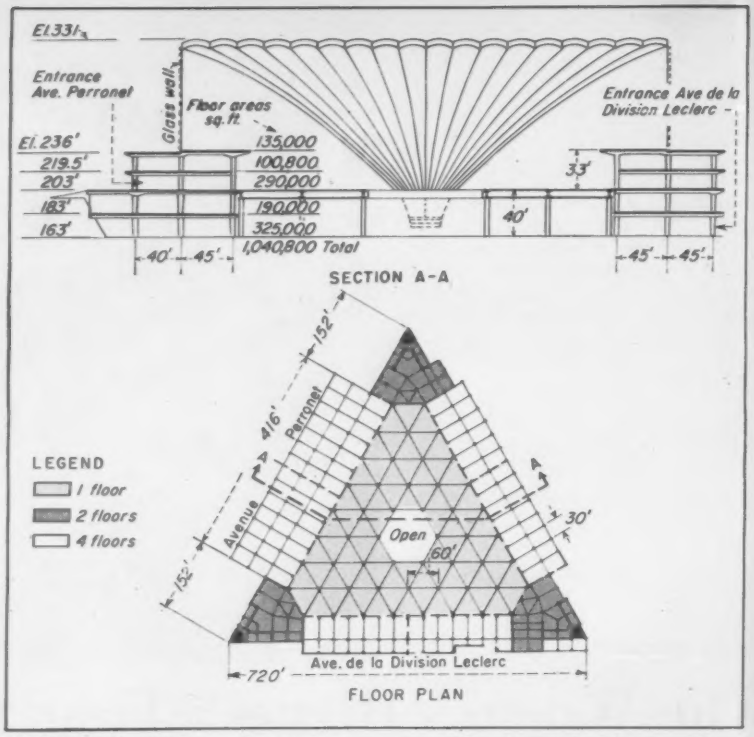
The corner areas of the exposition palace, where irregular column spacing had to be used, did not lend themselves economically to precast construction. All floors in these areas—30,000 sq ft on two levels—were therefore cast in place.

• **Triangular slab floor**—Structurally, it is the treatment of the main floor, covering the triangular shaped core of the building at El 203, which commands interest secondary only to that of the roof. This floor, exclusive of a hexagonal opening 60 ft on a side at its center, has an area of 120,000 sq ft.

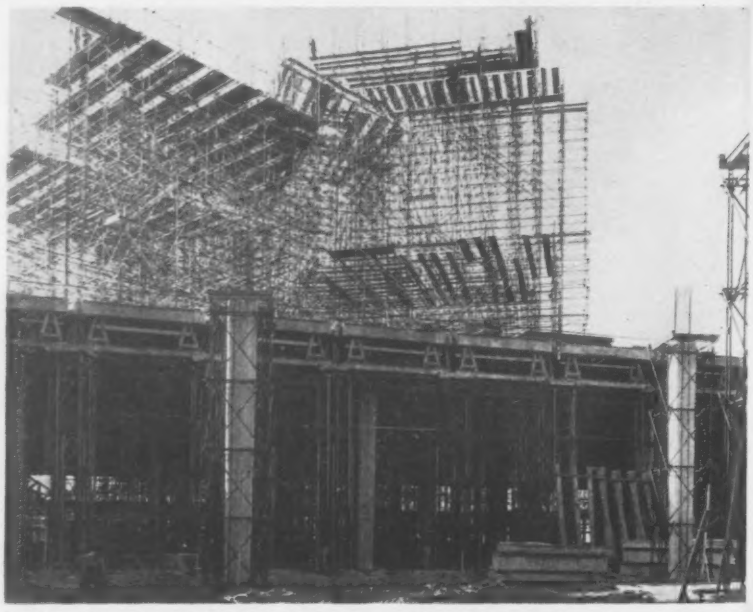
Three basic considerations influenced the design of this main floor—a minimum number of columns, a minimum thickness of floor taking into account the need for accessible utility piping and electrical conduits, and a reasonably good appearance from below.

The outcome of these requirements was a 60 ft column spacing in a triangular pattern and a double floor of precast triangular units. The two slabs of the double floor are placed 6 ft apart, with the space between used as a utility gallery. The upper slab is designed for a live load of 220 psf and the lower one for 22 psf.

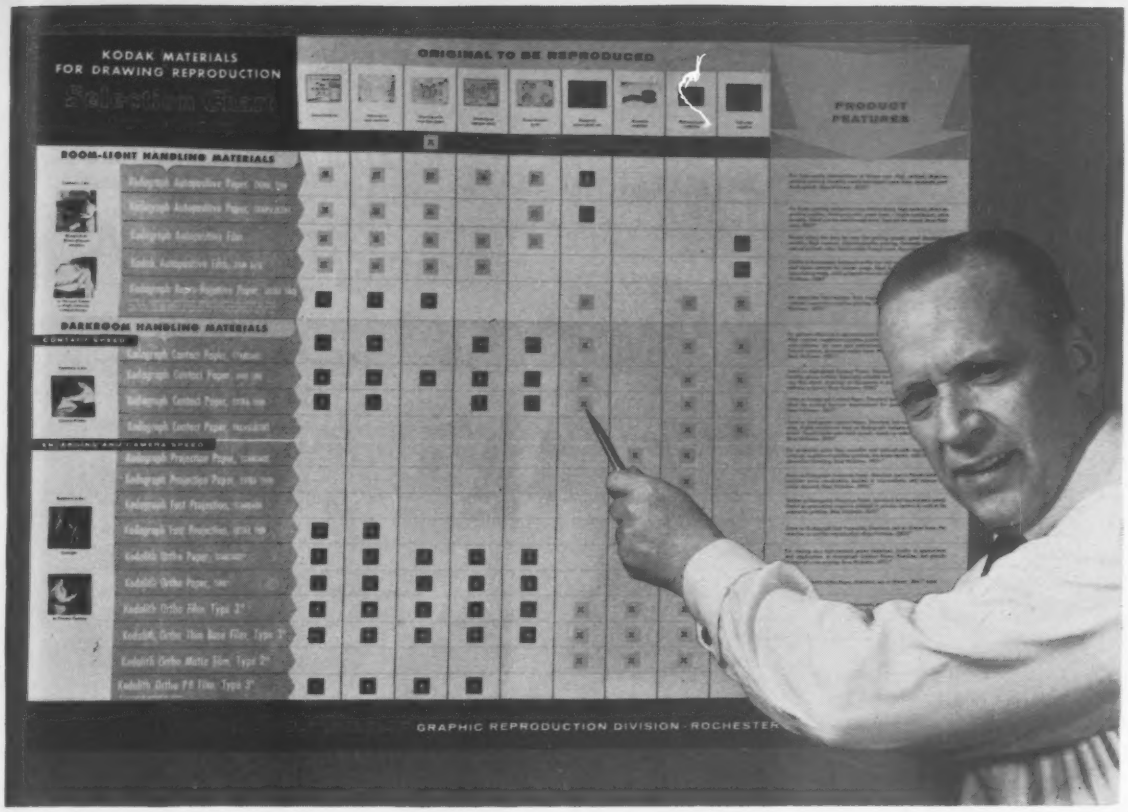
The precast triangular floor units have sides 20 ft long, and there are thus nine of them in each of the 60 ft triangular floor panels outlined by the columns. The slab of the upper floor units is 3 in. thick, that of the lower 2½ in., and both are stiffened by edge flanges—23 in. deep for the upper units



EXPOSITION HALL contains four separate structural systems—triangular framed core, rectangular framed side buildings, irregularly framed corner areas, and the roof.



CONSTRUCTING THE MAIN FLOOR required steel falsework from the ground to support the lower slab and timber A-frames to carry the upper one. Space between will be a utility gallery. In background, tubular steel falsework for roof is being erected.



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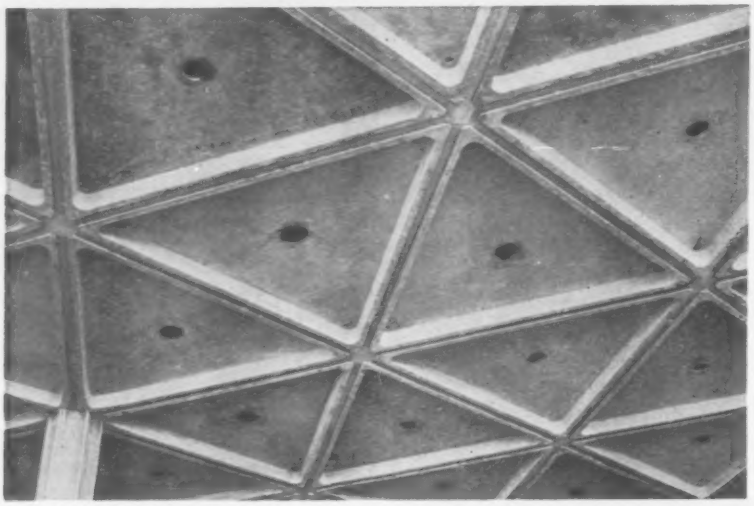
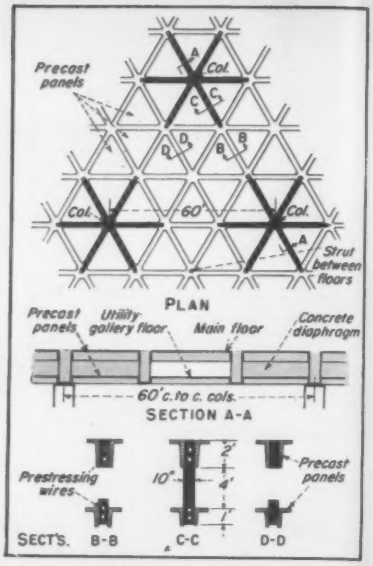
. . . Thin shell roof covers novel triangular panel floor

MAIN FLOOR PANELS ready for concreting the joints. The joints along the column lines are equipped with prestressed wires to become the carrying beams of the floor system.



TRIANGULAR PANELS of utility gallery floor furnish an unusual ceiling pattern for the ground floor. The holes in the panels are for lighting fixtures.



HOW TRIANGULAR PANELS are combined to create the double slab main floor.

and 11 in. deep for the lower ones. The upper floor units weigh 4.5 tons each, the lower 3 tons.

Assembled on tubular steel falsework, the two levels of precast floor units are made to function as a single structural entity by prestressed concrete "beams" cast in place in the joints that run along the column lines. These beams also serve as vertical diaphragms between the two slabs, and in addition there is a vertical strut at the center of each 60 ft triangular floor panel. The beams have a solid section 7 ft deep and 10 in. thick for a distance of 20 ft out from each column, while in their central 20 ft length they are pierced by an opening 18 ft long and 3 ft 4 in. high to provide free access throughout the utility gallery for operating personnel.

Two prestressing wires are placed near both the top and bottom of these beams and stressed to 100 tons. The wires are continuous from one side of the floor to the other, so that the longest of them attain a length of 470 ft. They were prestressed in segments.

To complete the structural integrity of the floor, all joints between the precast units are filled with concrete. The prestressing along the column line joints also helps to compress the precast units into a solid slab.

• **Remarkable double shell roof**—Although all the parts of the exposition palace are unusual in some respect, it is the roof which affords the element of particular interest. The principal technical requirement was to provide a shell which would resist both general and local buckling from its own weight and from shrinkage and flow of the concrete. Thus both its flexural and torsional strength had to be unquestioned. The solution adopted was to use two corrugated shells, each 2½ in. thick except toward the abutments where the thickness increases to about 12 in. The shells are spaced 6 ft apart (increasing to about 10 ft toward the abutments) by a system of longitudinal and transverse diaphragms 2½ in. thick.

The general scheme of the roof is indicated in some of the accompanying illustrations. In each of the three facades of the building it spans 720 ft between the abutments, and rises to a height of 152 ft above its springing line.

From the apex of each facade, and at right angles to it, a rib runs to the central point of the roof. These ribs divide the shell into three sections structurally, taking the horizontal component of the roof thrusts and balancing them around the point of intersection of the ribs at the center. Schematically, the roof consists of three cylindrical surfaces intersecting on lines radiating from the abutments.

Each of the three roof sections is corrugated transversely, that is, the corrugations run lengthwise, fanning out and upward from the abutments to the ribs. The corrugations thus become flatter (have a progressively larger radius of curvature) the farther they extend from the abutments. It is through this variation in corrugation radius (from 10 ft at the abutments to 23 ft at the apex) that the roof thickness is

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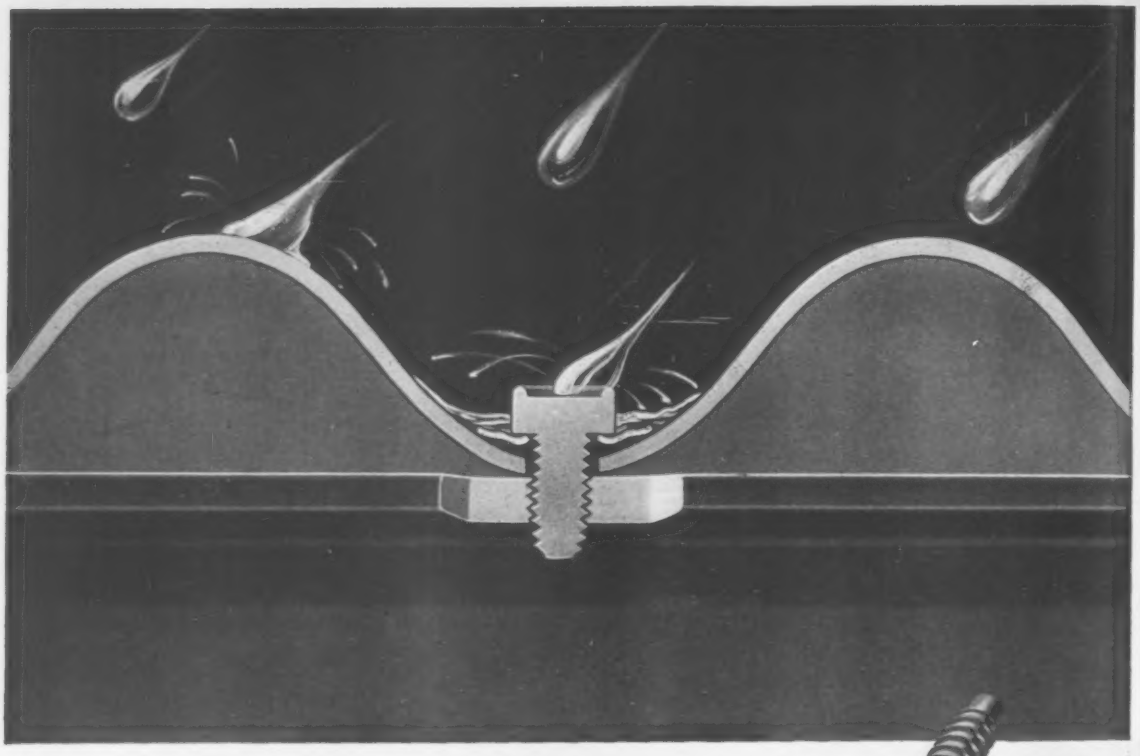

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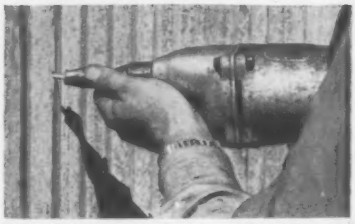

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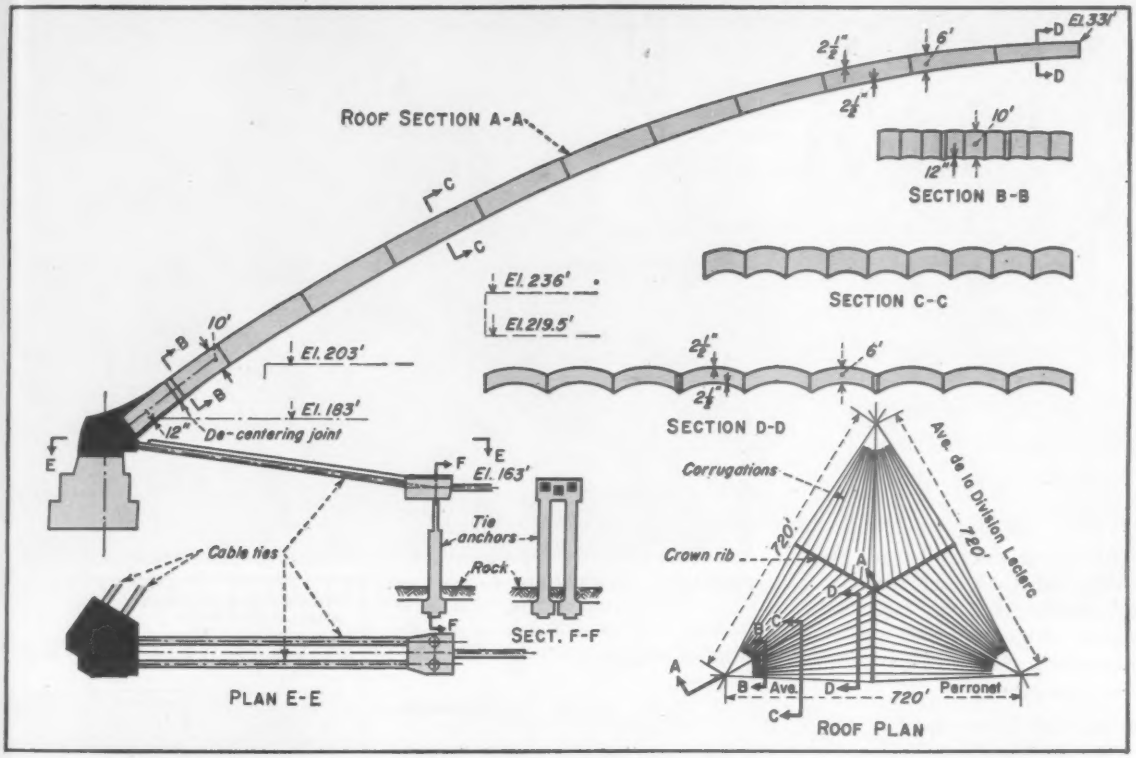
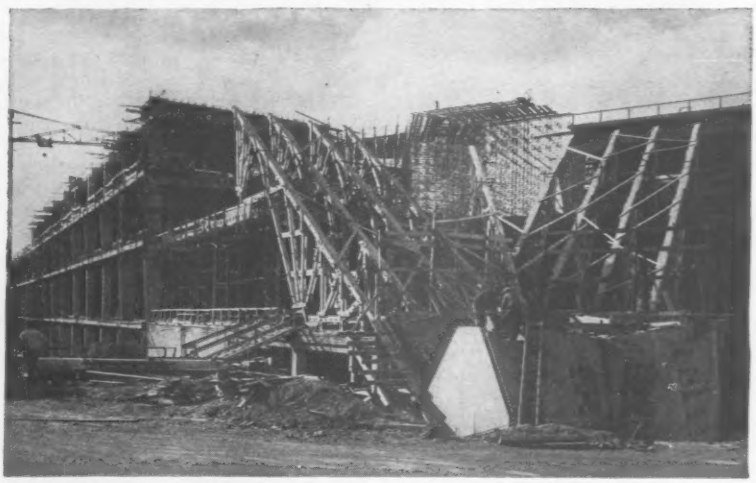


ROOF s composed of two corrugated shells spaced apart by diaphragms and supported by massive abutments tied together by underground cables. The roof spans 720 ft between supports and covers 5.5 acres.

caused to decrease from the abutments to the summit.

The roof transmits its reactions to three abutments, each consisting of concrete masses about 40 ft high which carry the vertical components of the load to the foundations. The horizontal components are taken by steel cable ties which connect the abutments along the edges of the building. Since the ties join the abutments at the roof springing line, which is at a higher elevation than the ground floor of the building, they have to be sloped downward to a point where they can run horizontally below this floor. At this point, anchorages are installed to resist the vertical component of the pull in the sloping portions of the tie.

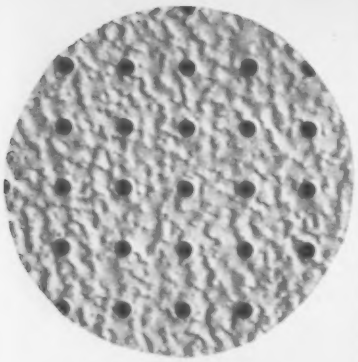
• **Roof construction**—The roof concrete is being placed in forms carried by a high movable falsework of steel tubing supported on the floor at El. 203. Hammerhead cranes, 100 ft high, which operated at ground level during construction of the building framing, have been jumped to the topmost floor level (El 236) for the placing of the roof concrete, which is brought to the site in truck mixers from a central batching plant. The cranes, which had a capacity of 3 tons on a boom arm of 100 ft for the ground level work, have been altered to pick up 1½ tons at 165 ft for the roof construction operations.



FIXED TIMBER FALSEWORK was used for the lower parts of the roof adjacent to the abutments in contrast to the movable steel falsework used for the higher and larger areas.

With the abutments completed, including the lower part of the roof up to where de-centering jacks are installed (just below where the corrugations begin), roof concreting is carried out in three phases as indicated on an accompanying drawing. The tubular steel falsework, mounted on rollers riding on the floor at El. 203, is moved from phase to phase, starting with the central part of the roof and continuing outward. Forms for the bottom shell are of steel plate, those for the upper shell of a 1½ in. wood fiber board, which will be left in to aid insulation.

(*Continued on page 52*)



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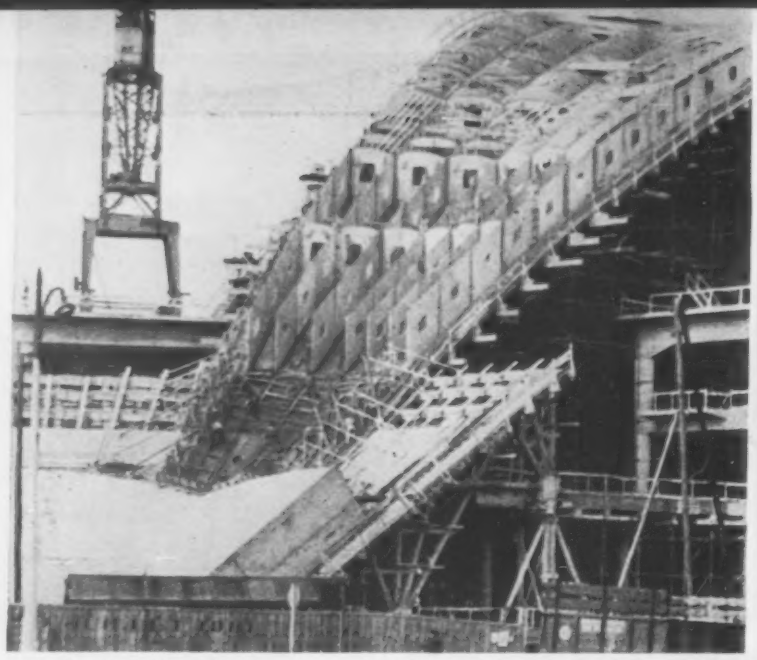
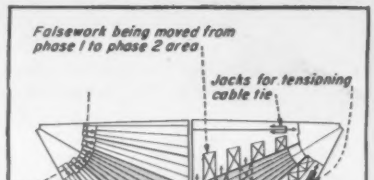


PRECAST DIAPHRAGMS are set on forms of lower shell of roof, prior to its concreting, and in position to support the forms for the upper shell.

ROOF CONCRETING is done in three phases working from middle outward. Hydraulic jacks aid in de-centering.



The first phase concreting is six corrugations wide in each of the three roof segments which intersect along the apex ribs. At the conclusion of this stage, the part of the roof completed will be in the shape of a three-pointed star. Rendering this slender part of the roof self-supporting by simultaneous operation of the de-centering jacks and of jacks in the abutment ties, followed by moving the falsework, will be the most critical operation of the roof construction procedure.

The de-centering jacks, each of 500 tons capacity, are placed at a point in the roof where the shells are thickest so that their thrusts will not cause buckling. In this position they are also relatively near the 100 ton jacks in the ties, so that all jack manipulations can be synchronized.

The first phase concrete will be de-centered under its dead load only, without any consideration of future loads from temperature, etc. Accordingly, after the falsework is moved, the jacks will return the roof to the position it had when it was supported. At the same time, tension will be increased in the ties, corresponding to the thrust from the phase 1 concrete.

The second and third phase concreting, each three corrugations wide, on either side of the preceding phase, will be carried out following the same procedure used in the first phase.

At the end of the de-centering, the joints between the three phases will be concreted. Then the de-centering jacks will be operated to induce such loads into the roof as are necessary to compensate for further temperature, shrinkage and flow effects.

The building will require a total of 46,000 cu yd of concrete and 2,500 tons of steel of various kinds. The reinforcing steel used has an elastic limit of 55,000 psi and an ultimate strength of 69,000 psi. Steel for prestressing has an elastic limit of 172,000 psi and an ultimate of 192,000 psi. An extra hard steel is used for the ties, with a rupture strength close to 200,000 psi.

In addition to the building steel, the tubing for falsework totaled 850,000 linear feet.

INSTALLING CONTRACTOR: O. A. WENDT COMPANY, CHICAGO

1300 FEET of trench were needed, without special preparation or forms. Note simple concrete supports—no anchors are evident.

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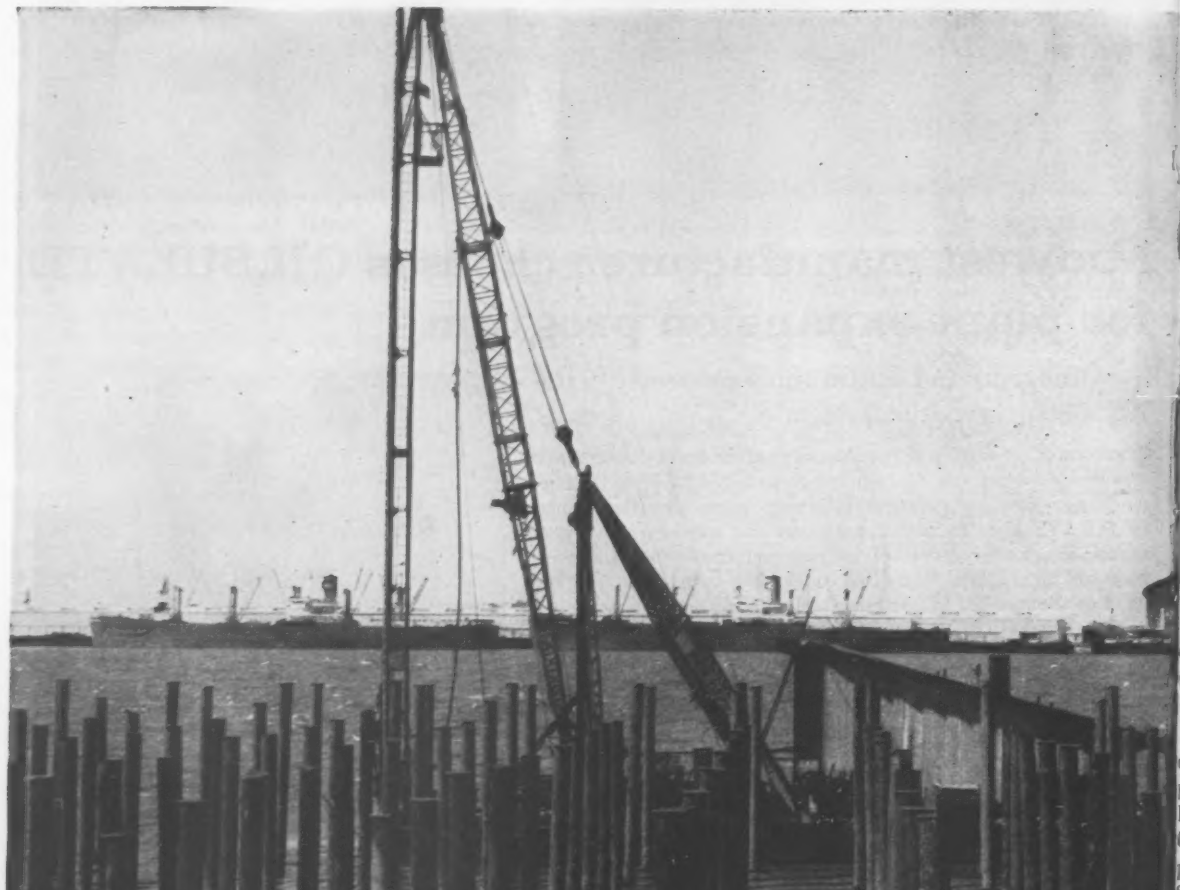
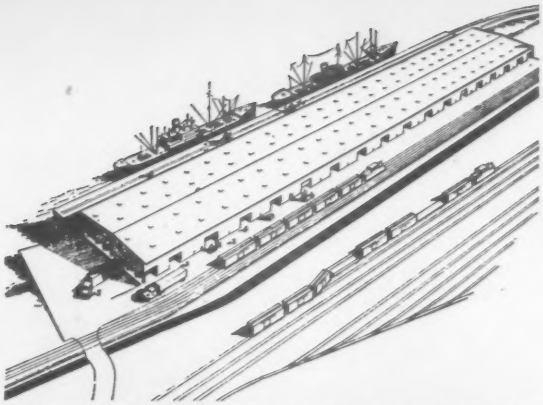
New Wharf for Port of
to sit on 2800 Armco



Barge-mounted rig drives Armco Pipe Piles for foundation of the 1000-foot-long Perry Street Wharf for the Port of New Orleans. Ships in background are at wharves on east side of the river near the city. New wharf developments are on the west bank.

ARMCO CONSTRUCTION

New Orleans Pipe Piles



New Perry Street Wharf, under construction for the Board of Port Commissioners of the Port of New Orleans, is an important part of a 10-year, $72 million construction and modernization program for New Orleans port facilities. When completed, the big 230,000-square-foot wharf will rest on 2800 Armco Steel Pipe Piles.

There are good reasons for the selection of Armco Pipe Piles. The use of steel eliminates the requirement of a fire-sprinkler system used under timber wharves. In addition, modern cargo handling equipment puts high stresses on the wharf floor. Armco Piles provide the high bearing capacity to accommodate these anticipated loads.

MANY OTHER ADVANTAGES

During construction, Armco Pipe Piles give additional benefits. They can be inspected *after* driving. They're easy to check for alignment and watertightness. Another plus is the long lengths of Armco Piling. Where required lengths are known in advance, as with this project, they can be ordered to meet those needs. Pile length for the wharf is 105 feet, made up of two lengths spliced at the site.

Add the 132 different diameter-wall thickness combinations available in Armco Pipe Piling, and you have another advantage. For example, design of the wharf called for the top 45′ of each pile to have .250″ wall thickness, bottom 60-foot section .188″ wall thickness. Like all Armco Piling, the piling in the Perry Street Wharf was produced to high quality standards; to engineers' specifications.

Armco Pipe Piling is one of a big family of Armco Construction Products. The list includes such service-proved products as Armco Corrugated Metal Drainage Structures, FLEX-BEAM® Guardrail, Steel Buildings, Water Control Gates, Bin-Type Retaining Walls, and a widely used companion product of Armco Piles—Armco HEL-COR® Pile Shells. Send for complete information. Just fill in and mail the handy coupon. Armco Drainage & Metal Products, Inc., 4518 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

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CONDENSED DATA

Pile length: 105′
Number of Piles: 2800
Pile Diameter:
54 Piles, 18″ O.D.
258 Piles, 16″ O.D.
294 Piles, 14″ O.D.
2194 Piles, 12¾″ O.D.
Wall Thickness:
Bottom 60′, .188″
Top 45′, .250″
Design Load: 50 tons/pile
Manufacturer's Certification: ASTM Designation A-252 Grade 2.
Contractor: Boh Brothers Construction Company
Director of Engineering for Board of Commissioners of the Port of New Orleans—W. T. Hogg

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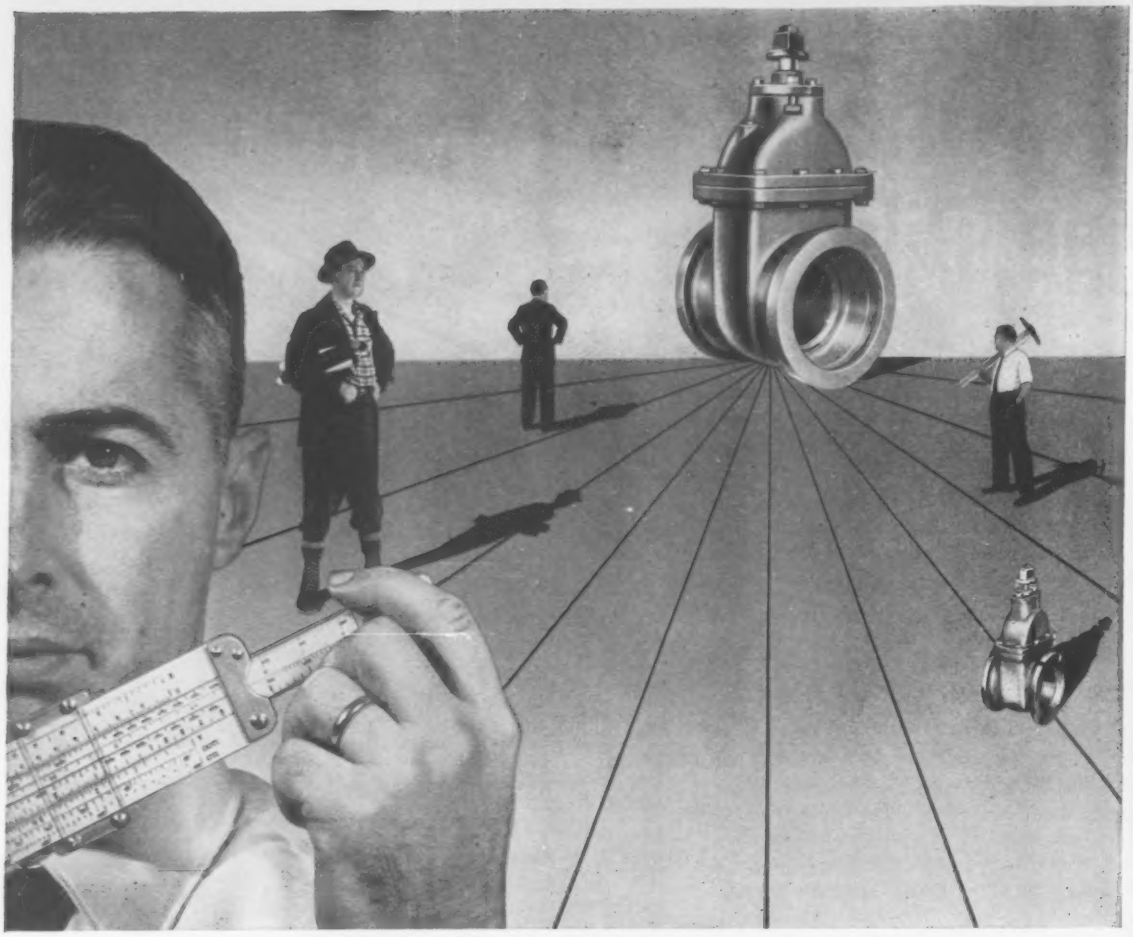

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Did Ancient Water Engineers Know Best?

Israeli scientists discover how Nabatean hydraulicians made Negev desert green 2,000 years ago by skillful distribution of water from meager, once-a-year rains

Hillel Shuval
McGraw-Hill World News
Jerusalem, Israel

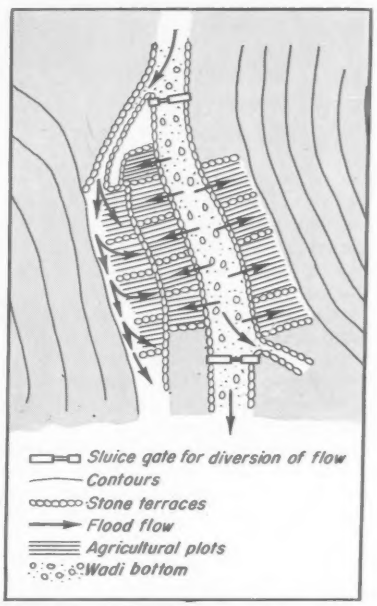
Searching for new ways to conquer the parched Negev desert, Israeli scientists have discovered how master water engineers a century before the birth of Christ were able to produce a crop a year from an annual rainfall of about 4 in. Ancient Nabatean farmer-engineers built intricate works to increase the runoff of the year's concentrated rainfall and to direct it to farmland along the area's wadis (dry gullies). Here, stone terraces caught the fertile soil-laden water and allowed it to infiltrate sufficiently to provide water for a single crop.

It is noteworthy that these early conquerors of the Negev found their solution through water spreading rather than massive impounding of the once a year flood flows. Contemporary Israeli engineers, in attempting large impoundments, have been thwarted by extremely high seepage losses and devastating rates of evaporation caused by the extremely hot, dry climate of the region. Consequently, great interest is being shown in adapting the successful ancient methods in the 20th Century effort to make the Negev green.

MYSTERIOUS STONE MOUNDS increased runoff from hills (by exposing impervious soil) and directed it to spreading basins along the valleys of the Negev desert.

• **Grew fruits and staples**—How the thriving Nabatean kingdom in the desert highlands of the western Negev supported itself has long been a mystery

TERRACED BOTTOMS OF WADIS (dry gullies) allowed flood waters to infiltrate and fertile silt to settle. Loessial soil could produce one crop a year from one rainfall.



SKILLFUL DIVERSION systems using dams and gates are found on deeper wadis.

. . . Hydraulic structures built in 100 B.C. are in good condition today

DIVERSION CHANNELS formed by carefully placed stone carried flow from wadis to . . .

DEEP CISTERNS cut in limestone which stored winter floods for year around drinking water.

STONE STEPPED SPILLWAY is well preserved and functions as effectively as it did when built 2,000 years ago. A few Bedouin tribesmen still use structures today.

TYPICAL SLUICE GATE. Note notches for diverting flow in two directions.

to hydrologists. Inscriptions, found on papyrus records discovered in one of the ancient Negev cities, reveal that the desert farmers of 2,000 years ago produced good yields of barley, wheat, legumes, grapes, figs and dates.

Farming in such an arid area seemed hard to explain, and some authorities have hypothesized that the climate of the region must have changed since ancient times. However, all data gathered by the current and earlier investigators point to the fact that even in ancient times the industrious settlers of the area managed on no more than the four inches of annual rainfall available today.

The existence of the ingenious water conservation systems was revealed in 1930, but an explanation of how they functioned is the result of current work by a group of Israeli scientists. After making a complete aerial survey of the region and detailed ground studies of several of the typical water collecting systems, a clear picture has been gathered.

In the Negev, the meager rain that does fall is concentrated in the winter months and often in a single deluge. Owing to the general lack of vegetative cover and to the loessial soil crust, which partially seals the region's surface, runoff rates reach as high as 95%. These conditions lead to flash floods which rage along the wadis. Erosion rates are high and soil laden waters deposit fine silt in the wadis each year.

• **Catch last drop of water**—The Nabateans developed extensive systems of conduits, diversion structures and terraces in the long, twisting wadi bottoms, which not only utilized every bit of rushing water, but trapped the valuable silt to improve their land.

The infiltration rate of the loessial wadi bottoms is sufficient to enable a single flood to provide water for the growing of a single crop annually.

Water for drinking purposes was diverted into cisterns cut into the limestone bedrock found along the wadis in the region. Many of these deep, shaded cisterns have been found intact, and some are still used by wandering Bedouins who carefully pass on knowledge of their location.

On small tributary wadis, stone terraces were constructed across the streambed to form a series of steps to catch the flood flow. The soil laden water then sank in slowly after the flash flow subsided.

The main wadis were also converted into a series of basins, but a more elab-

today there stands a city–

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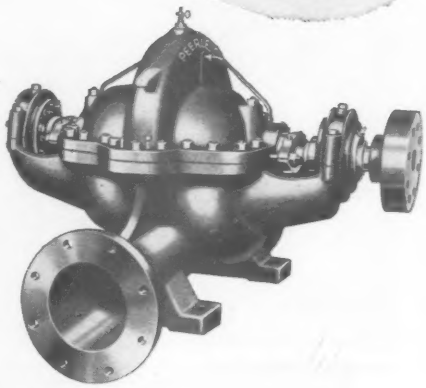

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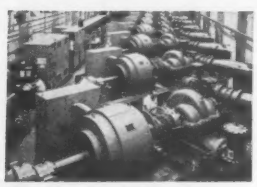

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One of the boats now being built in this plant

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"The Rilco trusses were assembled and erected in one week by men with no previous experience in this type of work. The structure, with its clear span and high ceiling, gives us a flexibility of production layout that we never before were able to achieve.

"We are so well pleased with this structure that we are planning to use the same type construction in a new 9000-square-foot addition," Duratech Corp.

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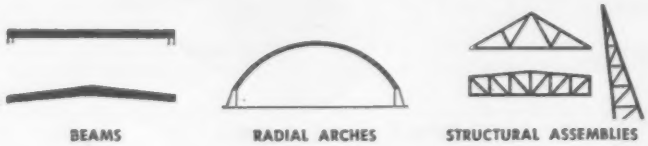

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. . . Ancient hydraulicians

orate system of stone and masonry walls diverted the flow from the wadi bed to high plots along the sides. In addition, diversion structures often sent water from some upstream point to broader spreading basins farther downstream, adjacent to the main wadi, as shown in the accompanying drawing.* Careful measurements show that the Nabateans were extremely skillful in diverting optimum amounts of flood flows to the terraced basins.

Many of the water control structures, constructed of local stone, are well preserved and function as effectively as when designed 2,000 years ago. In a few locations local Bedouin tribesmen have caught on to the ancient methods and have successfully grown barley in the terraced basins. Those lonely lush green fields come as a shock to the uninformed traveler in the otherwise scorched brown Negev landscape.

• **Mysterious stone mounds**—The most baffling of the Nabatean engineering works are the hilltops covered with carefully laid out mounds of stones. The Israeli researchers have concluded that since the Nabateans based their system on high rates of runoff, it is logical that they cleared away the stones on those hilltops having high percolation rates. The bared earth surface rapidly developed an impermeable crust which enabled larger amounts of water to reach the wadi bottoms. The layout of the stones as seen clearly from aerial photos indicates that the stone mounds were oriented in rows so as to divert the runoff thus attained to the areas most in need of the water.

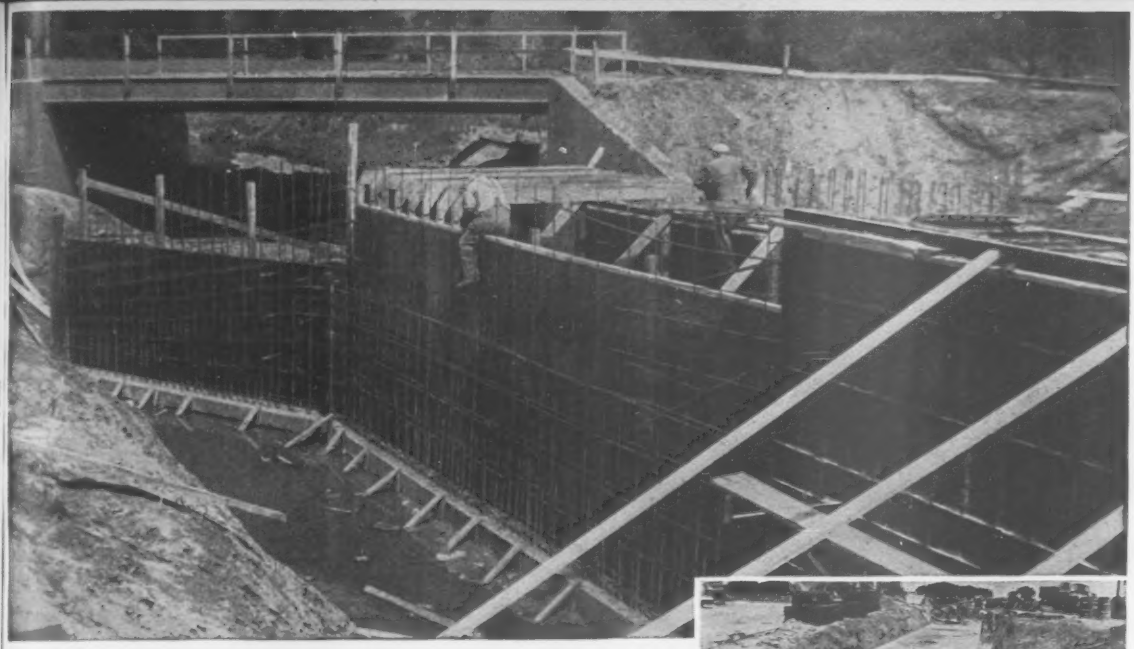
The research group has estimated that the Nabateans farmed 25,000 acres of the Negev desert highlands.

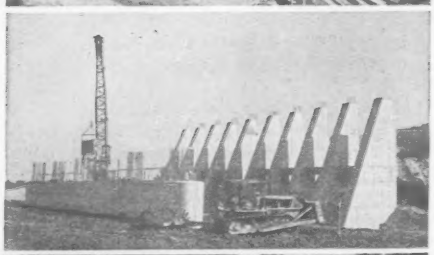
• **Would duplicate systems**—Accepting this explanation of Nabatean methods, the investigators would now establish a study team at one of the old sites for at least two rain seasons to make more accurate measurements of the flood flows, runoff and percolation rates. It is proposed that one of the diversion and water spreading systems be fully rehabilitated and that actual crops be grown as they were 2,000 years ago.

The Israeli group is confident that with the data obtained from such an expedition, large scale pilot settlements, or re-settlements, could be attempted in the western Negev highlands.

The current research group is headed by botanist Mikhael Even-Ari, vice president of Hebrew University in Jerusalem and includes L. Shonan, a hydraulician, and N. Tadmor, agronomist.

(Editor's Note: Author Shuval is also a practicing civil engineer in Israel.)





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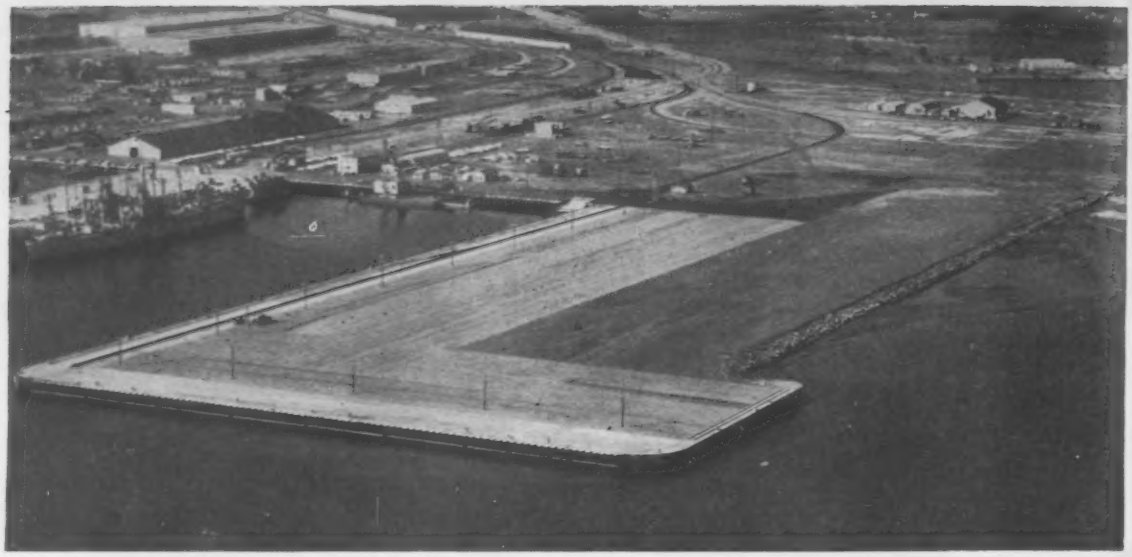


Navy gets 896,000 sq ft of deck as . . .

Sheetpile Cells and Sand Make a Pier

Some 650,000 cu yd of hydraulically placed fill behind an L-shaped string of sheetpile cells projected into Narragansett Bay make a pier with a deck area of over 896,000 sq ft for the U. S. Naval Construction Battalion Center, Davisville, R. I.

The pier—completed early in March—almost doubles the waterfront capability of the center. And such capability is important to the center since it concerns itself primarly with shipping—after assembling and testing—materials to be used in construction of military bases overseas.

• **Sheetpile cells**—The pier measures roughly 1,450 ft long by 652 ft wide. It contains 56 sheetpile cells, each 52 ft 8 in. by 37 ft.

The cells are strung together to form a 1,200 ft long projection into the bay, then turned left to run another 652 ft somewhat parallel to the shore. A fillip at the end of this giant "L" returns 306 ft shoreward, connecting to a 1,460 ft long granite riprapped earth dike running back to shore.

The cells are constructed of shallow arcs with ½-in.-thick-web piles used on the outboard arcs and ⅜-in.-thick-web on the inboard arcs and diaphragms. The piles in the arcs are driven to 45 ft below mean low water and the diaphragms to 37 ft. With navigation depths set at 30 ft minimum, the elevation of the deck is put at 12 ft above mean low water with 57-ft-long arc piles and 49-ft.-long diaphragm piles.

The cellular sheetpiling is designed to withstand uniform live loads on the pier of 1,000 psf.

The piles are driven into what is basically a medium to firm fine sand, although in some places going to full depth necessitated driving through medium-size stones and hardpan.

The cells and the area they enclose are filled with 650,000 cu yd of hydraulically placed sand. This material was dredged up from the berthing spaces adjacent to the pier and from a new turning basin just off the end of the pier.

• **Keeping fines in**—The fill material contains about 18% fines. This meant the use of a seal coat (to a height in the cells that would cover tidal ranges) to prevent exfiltration of these fines through the sheetpile interlocks. Such covering is protection against corrosion also.

The original idea had been to airplace concrete on wire mesh over the inside of the outboard arcs. But this method of sealing was discarded after it was realized that such a covering would not be flexible enough to respond to the sway induced in the unfilled cells by winds in excess of 35 knots.

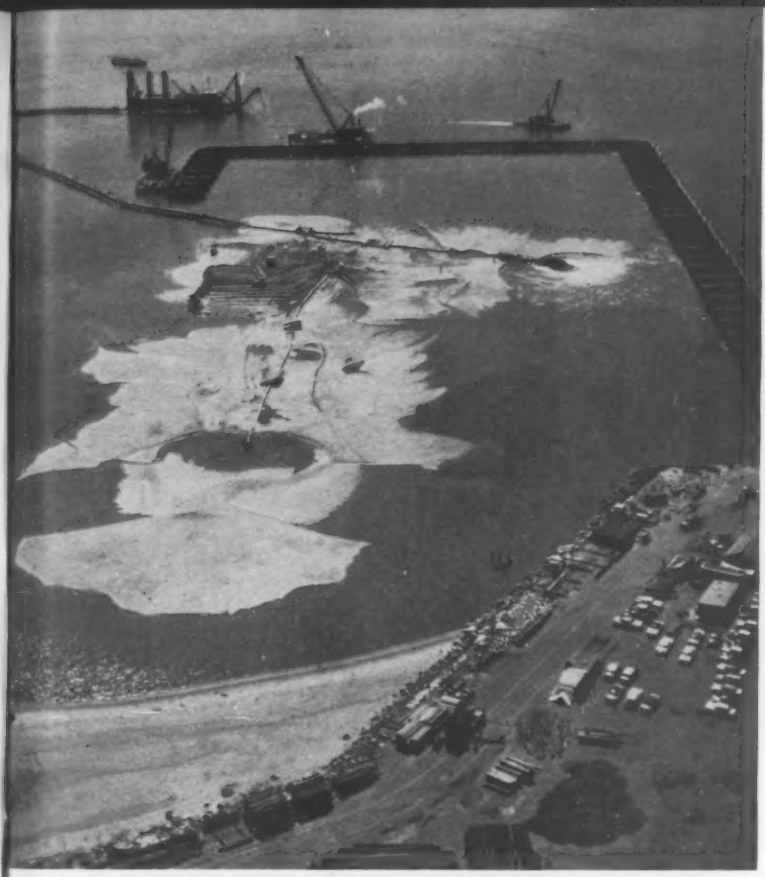
A more flexible asphalt and fabric coating was chosen instead. Each cell was first dewatered to a depth of 4½ ft below mean low water. The surface to be covered—down to 3 ft below and up to 10 ft above mean low water, for a total height of 13 ft—was flame dried. An asphalt-asbestos mix of trowling consistency was applied with a heavy bristle brush at the rate of 3 gal per 100 sq ft. On this wet film was pressed a full-seal membrane fabric. This was a very tightly woven material of high tensile-strength impregnated with an asphalt compound compatible with the base asphalt-asbestos cement. The fabric in turn was covered with the base coat compound, this time at the rate of 7 gal per 100 sq ft.

The seal strip is applied along the inside face of the outboard arcs and is continued on to four piles in each diaphragm. The band in each cell measures a total of 43 ft long by 13 ft high. The whole process was done by four men working at the rate of 1½ cells a day.

This membrane system easily withstood hydrostatic pressure of 7 ft during tests and is estimated to have cost 18% less than air-placed concrete.

Exterior face of the outboard sheetpiles is protected by two coats of a cold-applied coal-tar-base compound and one coat of bituminous emulsion coating running from the mean low water mark to the top of the piles. Continuous cathodic protection is provided below the waterline.

• **Surfacing the pier**—The pier is surfaced with reinforced portland cement concrete for a distance of 60 ft back of the sheetpile faces, and with penetration macadam for a distance of 240 ft inboard of this rigid pavement. The remainder of the pier surface consists of a minimum 6 in. layer of rolled bank-run gravel. The concrete pavement is



ASPHALT AND FABRIC SEAL is applied to interior face of outboard piles to contain sand fines in fill.

←

DREDGED SAND is hydraulically placed behind L-shaped string of sheetpile cells.

designed to take such loads as a 65 ton capacity crawler crane having 100 ton deadload.

Two railroad tracks supported on reinforced concrete girders and steel H-piles run the length of the pier. And services, such as fresh water, lighting, power, fire protection and fire alarms, are provided at regular intervals along the structure.

Contract for the pier covered a 500-ft-long sheetpile bulkhead along the shoreline adjacent to the pier, with approximately 9,000 sq yd of bituminous concrete pavement inboard from this bulkhead. Contract also included an LST landing ramp, 36 ft 6 in. wide—built of reinforced concrete and supported on bearing piers—cut into the bulkhead. The ramp is designed to accommodate loading and unloading operations through the bow doors or the side of any size LST in commission or contemplated.

The pier and adjuncts were started in August, 1956, and built, under a total contract of $3.4 million, by Merritt-Chapman & Scott Corp., with Gustave G. Werner, Jr., vice president in charge and Gar Tinsley project manager. Contracting officer was the Chief of Civil Engineers, Bureau of Yards and Docks, under whose general supervision design and construction falls. Present Chief is R. Adm. Eugene J. Peltier, and officer in charge of construction is Capt. Joseph P. Plichta, District Public Works Officer, First Naval District. Design engineers was the firm of Jenks and Ballou of Providence, R. I.

LST LOADING RAMP, of reinforced concrete, is built into bulkhead adjacent to new pier.

At Markland, Ky. (60 miles down river from Cincinnati), Dravo is building one of the largest locks ever planned for the Ohio River. This project and two others like it are part of the U. S. Corps of Engineers' long-range program to replace 46 obsolete locks and dams on the entire river.

NEW GIANT LOCKS for the busy Ohio

The $18½ million Markland Locks are typical of the special "in or around water" construction jobs handled by Dravo. To date, this job has required: a river cofferdam to seal off a 25-acre site; pumping out 350 million gallons of water from the lake that was formed; excavating a million cubic yards of earth and rock; using nearly a half-million cubic yards of concrete for the locks and guard walls.

Other examples of notable Dravo construction jobs can be found in Lake Superior, where a complete harbor and dock facility for ore boats has been completed . . . in New Orleans, where four main piers for the nation's longest highway cantilever bridge have been built . . . Burnside, La., where special dock and unloading facilities for seagoing vessels, waterway towboats and barges are now under construction.

If your plant expansion or modernization involves difficult construction and foundation problems or any of the products or services listed below—you may be interested in learning more about Dravo's special approach to the needs of industry. Write DRAVO CORPORATION, PITTSBURGH 25, PENNSYLVANIA.

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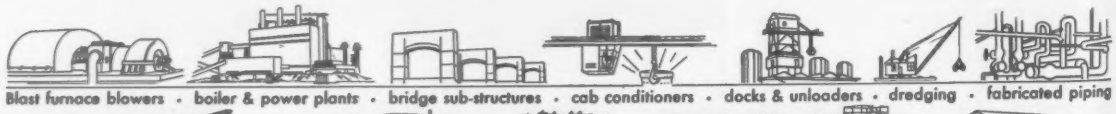
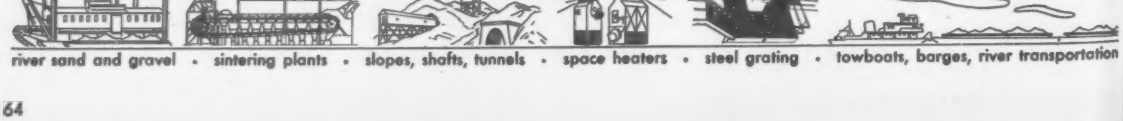


Blast furnace blowers • boiler & power plants • bridge sub-structures • cab conditioners • docks & unloaders • dredging • fabricated piping

foundations • gantry & floating cranes • gas & oil pumping stations • locks and dams • ore & coal bridges • process equipment • pumphouses & intakes



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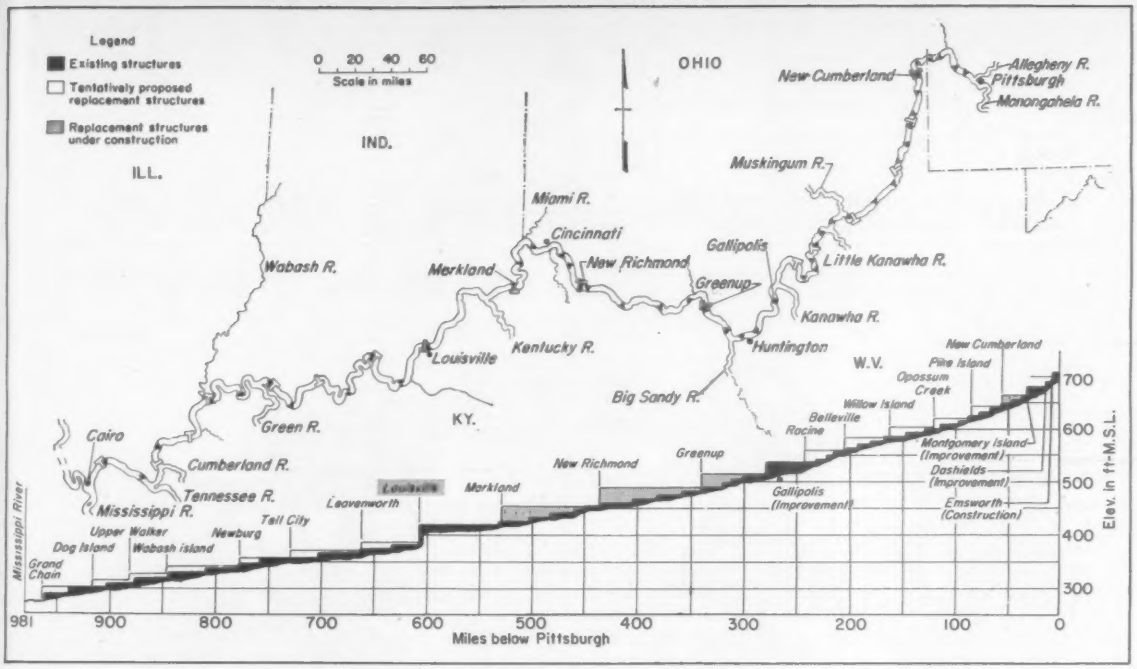


Fewer locks of larger size are key to billion dollar program of . . .

Modernizing Ohio River Navigation

Col. R. E. Smyser, Jr.
Division Engineer
Ohio River Division, Corps of Engineers
Cincinnati, Ohio

The billion dollar Ohio River navigation replacement and improvement program, now in its early construction stages, involves a new basic dam type for the Ohio which has occasioned radically different design criteria and a number of innovations.

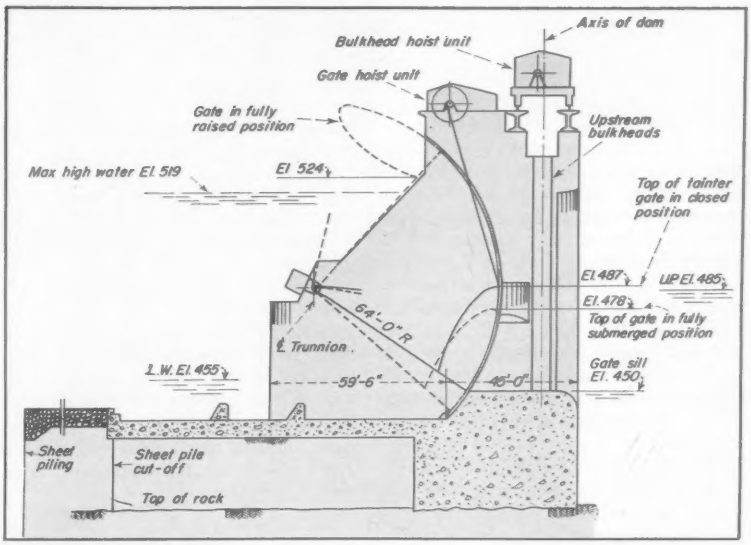
The old movable wicket dams whose sills are at riverbed level and thereby permit "open river" navigation at high stages, are being replaced by a fewer number of relatively high gated dams. Although the resulting longer and deeper pools will speed river travel, they also cause design problems in passing floods and debris and in lock filling and emptying. And, being non-navigable (because of gates and piers) they necessitate auxiliary locks for use when the main locks are down for repair.

Thus, the Ohio River modernization program is not simply a matter of building larger locks to accommodate ever increasing tons of river traffic.

The 981 miles of Ohio River are now served by 46 locks and dams creating a 9 ft minimum navigable depth. Most of the dams are of wicket type, each made passable by a main lock 600 ft long and 110 ft wide. Limiting dimension is the 600 ft, about one-half the size of optimum tow.

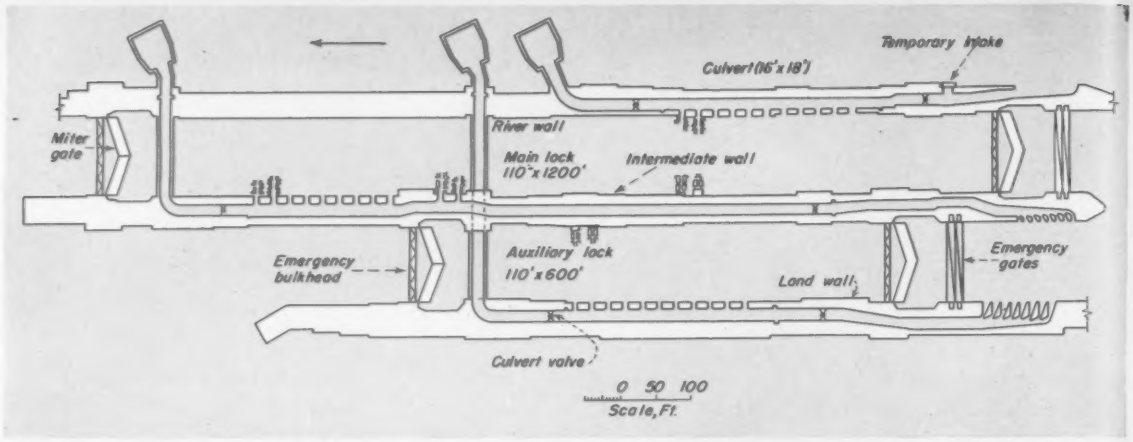
When the existing canalization system was completed in 1929, barge traffic on the Ohio totaled 1.6 billion ton-miles a year. Except for several dips during subsequent depression years, it has risen steadily to 16 billion ton-miles in 1956, a ten-fold increase more than half of which occurred since 1950.

(Continued on p. 66)



NEW BASIC DAM TYPE is a tainter gated structure which will eliminate open river navigation of the Ohio now possible with existing wicket gate dams.

. . . New Ohio River locks will have unusual filling and emptying system



TWO GROUPS OF BOTTOM LATERALS in main lock, each fed by separate culvert, will enable 1,200 x 110 ft main chambers to fill or empty in 8 minutes. New lifts will vary from 19 to 35 ft. Locks also feature submergible double lift vertical emergency gates

This huge growth is a reflection of the tremendous economic development in the Ohio River Valley. Since World War II, industry has spent about $15 billion there on capital facilities.

• **Early bottleneck seen**—In the foreseeable future, certain individual locks on the Ohio will just not be able to pass river traffic at the rates required. This adds a sense of urgency to the modernization program which is otherwise justified as reducing uneconomical towing times and operating costs.

As tentatively planned, 16 new navigation structures will replace 41 of the present 46 locks and dams, although this number may be reduced to 14 depending upon the results of studies, now under way, of the river below Louisville. The remaining five structures will be modernized by the construction of main locks 1,200 x 110 ft to supplement the existing 600 x 110 ft chambers.

Work on three new structures is under way: At Markland for $71.3 million, at Greenup for $62.2 million, and at New Cumberland for $43.5 million. Start at $74 million New Richmond Dam is scheduled for mid-1958. Modernization of Lock 41, at Louisville, is under way at an estimated cost of $50.4 million.

Benefits from the entire billion-dollar modernization program to commercial navigation are expected to exceed $100 million annually. This is more than double the annual charges of about $40 million, which cover interest and amortization on the capital investment together with annual operation and maintenance costs. In addition, the improvement program will provide more attractive recreational opportunities to thousands of small craft owners.

• **New dam type**—In planning our modernization program, it was recognized that fewer locks and dams, with locks of adequate size, would reduce travel time and tow operating costs. So would deeper pools, impounded by higher dams, by the reduction of resistance to propulsion. Fewer structures also would decrease the number of elements that must be maintained and operated.

But application of these criteria would result in non-navigable dams, while the existing concept was low movable dams with elements that can be rotated flat to the bottom of the river when stages are equal to, or greater than, the designed minimum navigable depth to permit navigation over the dams.

However, a careful study invalidated this concept for present and future river conditions. Open river navigation is advantageous only when the preponderance of cargo traffic is down river. This was the case originally, but it is now a thing of the past. The facility of moving that type of traffic on an open river, with the dam in lowered position, was the prime virtue of the wicket dam. With that advantage for the wicket dam eliminated, consideration could be given to higher dams of types which inherently prohibit open-river navigation.

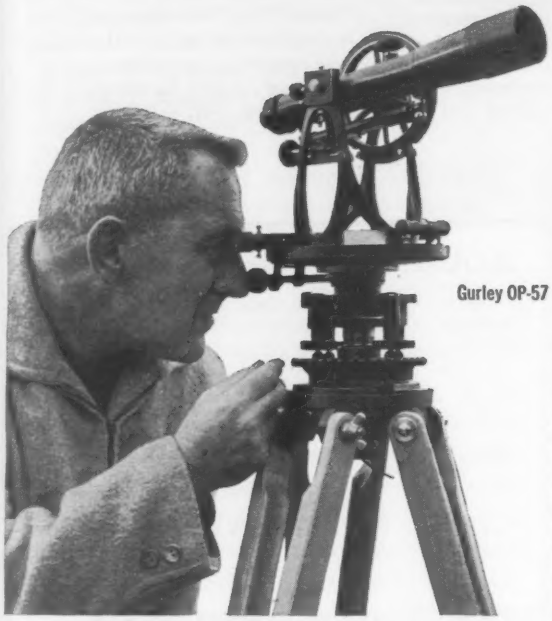
• **Limit on height**—There are practical limitations on the height of dam on the Ohio that can be supported economically. Generally, normal pools impounded by the dams must be kept within the banks of the Ohio. The reason for this will be recognized by anyone familiar with the high state of development, major transportation routes, and urban concentrations which are liberally distributed throughout most of the upper three-fifths of the valley above Louisville.

Within this limitation, then, the characteristics of the Ohio River channel have a decided bearing upon practical heights of dams. Above Louisville, the channel is relatively deeply entrenched except for the upper 25 miles in the Pittsburgh area. Impoundments in the range of 19 to 35 ft vertical steps, at intervals permitting establishment of a minimum channel depth of 9 to 12 ft, can be retained largely within banks. This factor resulted in our decision to have a 35 ft difference in normal pool elevation at Markland Dam, a 32 ft differential at Greenup (which will be reduced by 3 ft when we build New Richmond Dam) and a 22.6 ft difference in pool at New Cumberland.

In a valley with a history of floods as devastating as those of the Ohio, no artificial obstructions should be created which will materially add to the flood problem. The navigable wicket dam met this requirement admirably. With its sill essentially at river bed and with all the wickets laid down when river stages are far below flood level, it constitutes a minimal obstruction to flood flows. With a relatively high, non-navigable type dam, the answer to this problem is a gated dam with the gates surmounting a low sill, the crest of which is only a few feet above streambed. Such dams have been in use for a number of years in the upper Mississippi and upper Ohio Rivers.

By adopting this type of dam and locating it in a suitable river section, the swellhead created at the dam by the sill, piers, and lock structures can be held under 1 ft. The swellhead can be made even less by adapting the lock facilities to pass flow through the

Built-in optical plummets eliminate plumb bobs save set-up time...improve accuracy



Gurley OP-57

Gurley OP-137

The Gurley Optical Plummet Transit (Model OP-57) has proved itself to be such an important time and money saver in the field that this optical plummet feature has also been added to the Model 132 Standard Precise Transit. The new transit will be known as the OP-137.

Both these Optical Plummet Transits will save you time and trouble in setting over a point. The OP-57 and OP-137 eliminate the swing and sway of the cord and plummet—exasperating and time consuming. You will especially appreciate the increased accuracy on windy locations.

By rotating the instrument 180°, you can be assured of positive centering.

The Gurley Optical Plummet Transits are furnished with tripods which have built-in shifting heads. They allow a two-inch shift of instrument over the point, providing greater latitude in initial set-up.

Model OP-57 is recommended for very exacting work; the OP-137 for general engineering and construction work because of its shorter telescope, smaller size and its lighter weight.

Now in *two* models Gurley offers you an important advantage of the optical-reading theodolite *plus* the simplicity, ruggedness and proved performance of the American transit. *Write for new Bulletin OP-100.*

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Please send new bulletin OP-100 with details on Gurley's Optical Plummet Transits.

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CITY ZONE NO. STATE

"More highway work in 1958"

...say nation's construction editors in state-by-state survey of lettings

How much new contract work will there be in your area this year?

For a realistic answer to that question, LeTourneau-Westinghouse has just polled America's construction publications. Purpose of the survey: a down-to-earth appraisal of your specific *business opportunity*... as a roadbuilder... in 1958.

Because some highway progress reports are useless to contractors... in that they include projects years away from actual contract-letting... this L-W study has stressed *contracts*. Editors were asked *not* to consider work still in land-acquisition or preliminary engineering stages... or for which money was merely "apportioned" or "obligated." Instead, they were requested to estimate the actual dollar value of *highway construction contracts to be let this year*... and to compare those figures with 1957 totals.

Here are the editors' reports:

EAST:

Publications in New England and Middle Atlantic states indicate highway lettings this year should *increase by about 30%* over 1957. Here are their comparisons:

	1957	1958	Source
Connecticut	$ 34,547,230	$ 40,000,000	NERBA
Delaware	23,000,000	25,000,000	Constructioneer
Maine	13,919,329	20 to 25,000,000	NERBA
Maryland	60,000,000	65,000,000	Constructioneer
Massachusetts	52,005,937	90 to 105,000,000	NERBA
New Hampshire	18,114,950	25,000,000	NERBA
New Jersey	65,245,000	92,000,000	Constructioneer
New York	246,440,000	280,000,000	Constructioneer
Pennsylvania	185,500,000	272,600,000	Constructioneer
Rhode Island	11,064,415	15 to 18,000,000	NERBA
Vermont	9,937,786	18 to 20,000,000	NERBA

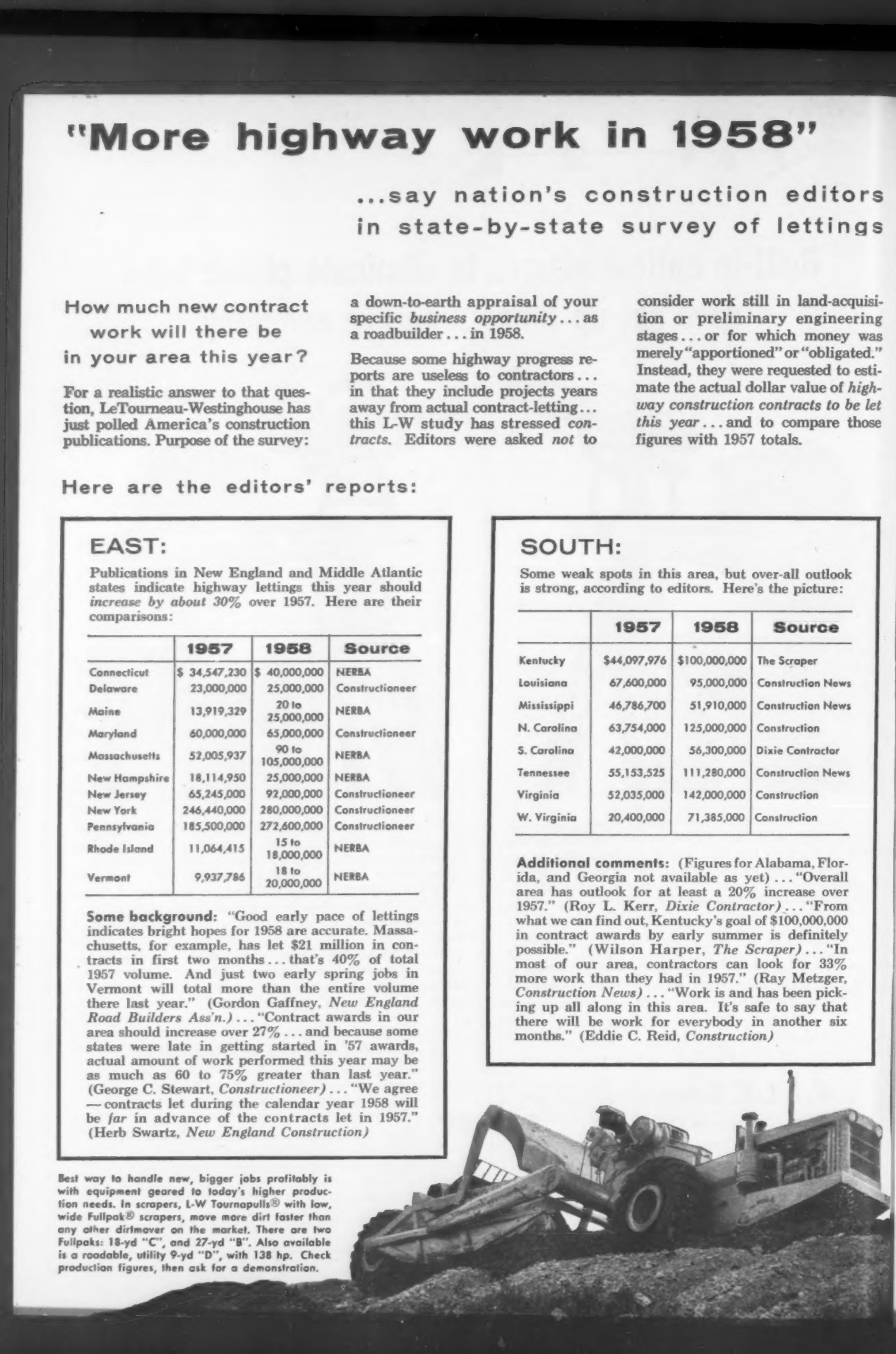
Some background: "Good early pace of lettings indicates bright hopes for 1958 are accurate. Massachusetts, for example, has let $21 million in contracts in first two months... that's 40% of total 1957 volume. And just two early spring jobs in Vermont will total more than the entire volume there last year." (Gordon Gaffney, *New England Road Builders Ass'n.)*... "Contract awards in our area should increase over 27%... and because some states were late in getting started in '57 awards, actual amount of work performed this year may be as much as 60 to 75% greater than last year." (George C. Stewart, *Constructioneer)*... "We agree — contracts let during the calendar year 1958 will be *far* in advance of the contracts let in 1957." (Herb Swartz, *New England Construction)*

SOUTH:

Some weak spots in this area, but over-all outlook is strong, according to editors. Here's the picture:

	1957	1958	Source
Kentucky	$44,097,976	$100,000,000	The Scraper
Louisiana	67,600,000	95,000,000	Construction News
Mississippi	46,786,700	51,910,000	Construction News
N. Carolina	63,754,000	125,000,000	Construction
S. Carolina	42,000,000	56,300,000	Dixie Contractor
Tennessee	55,153,525	111,280,000	Construction News
Virginia	52,035,000	142,000,000	Construction
W. Virginia	20,400,000	71,385,000	Construction

Additional comments: (Figures for Alabama, Florida, and Georgia not available as yet)... "Overall area has outlook for at least a 20% increase over 1957." (Roy L. Kerr, *Dixie Contractor)*... "From what we can find out, Kentucky's goal of $100,000,000 in contract awards by early summer is definitely possible." (Wilson Harper, *The Scraper)*... "In most of our area, contractors can look for 33% more work than they had in 1957." (Ray Metzger, *Construction News)*... "Work is and has been picking up all along in this area. It's safe to say that there will be work for everybody in another six months." (Eddie C. Reid, *Construction)*



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MIDWEST:

Forecasts from 7 publications indicate highway lettings in midwest will jump approximately 50% ... from $959 million in '57 to $1,439 million in '58.

	1957	1958	Source
Illinois	$105,000,000	$180,000,000	Construction Digest
Indiana	30,000,000	120,000,000	Construction Digest
Iowa	93,500,000	136,000,000	Midwest Contractor
Kansas	65,200,000	75,400,000	Midwest Contractor
Michigan	162,700,000	200,000,000	Mich. Cont. & Bldr. & Mich. Roads & Const.
Minnesota	67,600,000	96,000,000	Construction Bulletin
Missouri	76,608,000	100,200,000	Construction News
Nebraska	33,000,000	48,000,000	Midwest Contractor
N. Dakota	32,800,000	36,000,000	Construction Bulletin
Ohio	200,000,000	300,000,000	Construction Digest
S. Dakota	34,500,000	46,000,000	Construction Bulletin
Wisconsin	58,100,000	101,900,000	Western Builder

Selected comments: "Early year pace of lettings in Wisconsin is *way* ahead of early '57. Makes plan for over $100 million of work look very probable." (Earl P. Keyes, *Western Builder)* ... "In Minnesota, about $60 million in contracts should be let before June 30. And in South Dakota, the full $46,000,000 may be let in the first 6 months." (G. L. Anderson, *Construction Bulletin)* ... "Michigan has 5-year master plan for lettings that totals over $1,200,000,000." (Maurice Baker, *Michigan Roads & Construction)* ... "Indiana's planned 300% increase may seem improbable, but 1957 was far below potential. Governor Handley and Highway Chairman Peters both describe the $120 million program as 'one we know we can complete.'" (Arthur Graham, *Construction Digest)*

SOUTHWEST:

Here's the way construction publications in the southwest size up the '58 highway building year:

	1957	1958	Source
Arizona	$ 38,570,000	$ 41,650,000	Rocky Mt. Const.
Arkansas	20,327,000	48,500,000	Construction News
New Mexico	35,000,000	35,000,000	Rocky Mt. Const.
Oklahoma	37,962,000	41,759,000	Midwest Contractor
Texas	223,600,000	250,000,000	Texas Contractor

What they're saying: "That $250 million Texas figure is not for right-of-way purchases, preliminary engineering, maintenance, or force account work. It is the amount that will be put under contract this year through road contractors." (Wm. B. Morrison, *Texas Contractor)* ... "Looks like a good year. Comparison of state highway lettings of 1957 to planned lettings for '58 shows an increase of about 13%. This has been confirmed by awarding authorities." (James I. Clayton, *Rocky Mountain Construction)* ... "Arizona's made a big jump in its highway spending. Its current fiscal year budget is 46.7% larger than last year's." (John D. Bowler, *Southwest Builder & Contractor)*

WEST:

One of the strongest areas of all in 1958 outlook, despite "leveling off" in some states. Here's the rundown:

	1957	1958	Source
California	Not available	$220,000,000	SW Bldr. & Cont.
Colorado	$55,900,000	57,500,000	Rocky Mt. Const.
Idaho	19,000,000	25,000,000	Pac. Bldr. & Engr.
Montana	27,000,000	46,925,000	Pac. Bldr. & Engr.
Nevada	13,700,000	32,366,000	Rocky Mt. Const.
Oregon	41,000,000	50,000,000	Pac. Bldr. & Engr.
Utah	20,370,000	41,120,000	Rocky Mt. Const.
Washington	51,000,000	55 to 65,000,000	Pac. Bldr. & Engr.
Wyoming	35,442,000	36,100,000	Rocky Mt. Const.

Observations: "Highway construction along the coast should be up about 25%." (Roscoe Laing, *Pacific Builder & Engineer)* ... "Note the tremendous gains planned in expenditures for Nevada and Utah. They're due to the fact that both states are now in position to place a large amount of interstate work under contract." (Jack Tarpley, *Rocky Mountain Construction)*

LeTourneau-Westinghouse thanks editors and publishers who helped prepare this survey ... and hopes it encourages you as you plan for the construction season ahead.

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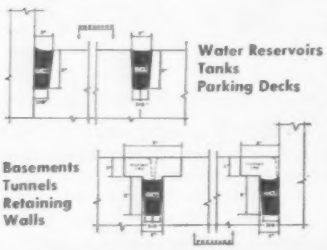

Ad 26-5

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. . . Billion dollar Ohio River Program

lock chambers when stages are reached at which locks can no longer be used.

• **Must pass debris**—Gated dams also must clear maximum river stages with the gates in fully raised position to avoid trapping debris and large floating objects which may be expected with high stages. On the Ohio, the criterion has been adopted of providing at least 5 ft of clearance. Since the range of stage is so great on the Ohio—as much as 80 ft in the Cincinnati area—dam piers must be quite high.

The new Ohio River dams are to have a minimum gate length of 100 ft. This length reasonably assures that debris will pass between piers. Gates also must be able to be lowered so their tops are 7 ft below normal pool elevation, to skim ice and debris over the gates when river stages are not high enough to permit raising the gates above the water surface.

• **Dual locks**—Inasmuch as all river traffic must pass through the locks at the new high dams, a second lock chamber is a vital safety factor to assure reasonably dependable service when the first chamber is closed for repair. The auxiliary lock also enhances the capability at each dam of passing large volumes of traffic that may develop in the future.

After extremely detailed study, size of the main lock chamber at each dam was established at 110 ft wide and 1,200 ft long, the same width and twice the length of existing locks. Auxiliary locks are to be 600 x 110 ft.

No general criterion has been set for height of lock walls for the new dams. Any criterion which would relate the height of lock wall to an average outage (from flooding) of so many days per year would not be consistent or realistic because it does not define the length and frequency of separate outages. Lock wall height will be optimized at each site. For example at Markland the walls are to be 11 ft above normal pool, which level in the last 40 years has been exceeded 5 times, each time between 3 and 14 days.

The 1,200 x 110 ft main chambers are to fill in about 8 min and empty in the same time. Thus, at 35 ft lift Markland, the average rate of filling and emptying is 9,600 cfs with the peak rate in excess of 17,000 cfs. Existing locks fill and empty through ports in the lock walls, whereas the new locks will have parallel lateral culverts across the lock floor following the schemes utilized for other recent high lift locks (ENR Aug. 30, 1956, p. 34).

• **Unique bottom lateral system**—Unlike any other lock in this country, however, one group of laterals is located in the center of the upstream half of the lock and is fed through a culvert in the river wall of the lock. This arrangement permits the discharge outlet for the upper group of laterals to be located near the center of the lock and shortens the length of the culvert which would otherwise be required in the river wall.

A second group of laterals is located in the center of the downstream half of the main lock. This group is fed by a culvert in the intermediate wall between the main and auxiliary locks. The discharge outlet for the lower group is carried from the lower end of the culvert in the intermediate wall across the bottom of the main lock and through the river wall to discharge in the river.

The idea for this design of the filling and emptying system, which splits the laterals into two separate groups, is of French origin, but the details of the best adapted location of the two groups within the lock chamber have been worked out by exhaustive model tests made for the high-lift Ohio River locks.

Tests indicate that hawser stresses developed when filling a 1,200 ft lock in 8 min will be very little, if any, greater than those which result from filling a 600 ft lock of equal lift in the same time.

A bottom lateral system also is used in the auxiliary lock, with a single group located near the center of this chamber. It is fed from a culvert in the land wall and discharges through the lower end of the culvert, across the auxiliary and main lock chambers and through the intermediate and river walls to the river.

• **Submergible lift gates**—A second unique feature of the locks are submergible double-leaf lift gates that are used for the emergency gates in both main and auxiliary chambers. (A single-leaf submergible gate was a feature of Eisenhower Lock on the St. Lawrence.) The gates are designed to be operated under maximum head and also under conditions of unrestrained flow through the lock chamber. When not in use, both leaves are lowered to prepared beds behind a concrete sill across the upper lock entrance above the upper miter gates. These gates have been tested in a model and results appear to be satisfactory. They will permit positive and rapid control in event of emergency and also will permit manipulation of the miter gates during flood stages so that the lock chamber can pass unrestrained flow below the dam.

Your grader-- production tool?...or overhead?

Make no mistake! Your grader is a production tool. It's *not* just an "overhead" item, or a "necessary evil" — as some might think. The work a grader does can be measured in yards of dirt moved per day... in days of earlier contract completion... in miles of ditch or grade finished to specification.

Grader more than earns its keep

While a grader does not load and carry dirt, it can increase over-all earthmoving production. It can smooth and drain roads so your haulers can "highball" more loads per day. It can spread fill evenly, for easier compaction... for faster on-the-run spreading. Your grader can maintain drainage in cut and fill... cut rainy weather delays... and eliminate soft spots that might slow or stop haulers.

The resulting speed-up, and extra production of your dirtmoving fleet is really the way to measure the pay-yard output of your graders. You get a saving in cost-per-yard... faster completion of your jobs... a substantial increase in your profits.

Bigger output adds to profits

The amount of work your grader can do has a direct bearing on *how much* profit it earns. A machine that cuts deeper, pushes a heavier load, turns a bigger windrow faster, will complete more work. You'll have more machine-time available to help speed-up the loading cycle... to assist pushers... to scarify tough spots... to windrow dirt for faster scraper loading.

Blade-accuracy cuts costs

The precision with which your machine cuts ditches and finish grades is very important, too. Exact control of the blade setting, the ability to hold that setting, and a minimum of deflection in tough materials... *all* reduce the number of "passes" required to finish to specifications.

Extra work-power for your grader dollar

You'll find that an Adams* grader will help you move more dirt faster, will shape-up more finished grade per day than any other comparable grader, for these 5 big reasons:

1. These LeTourneau-Westinghouse machines always work at, or nearer, full power. You have more working speeds, with less differential between each gear-ratio... always a "just-right" gear to blade at full power, and fastest practical speed.

2. Adams' fast travel speed (to 26 mph) saves time between jobs... high reverse speed (to 13 mph) gives you more push-cycles on one-way blading.

3. You get bonus push-power because 100% anti-friction drive delivers bigger percentage of engine power to tandem drive wheels.

4. The moldboard on an Adams is easier to control, because direct engine power always moves it at constant speed.

5. Husky "wishbone" frame provides a steady blade-mount... it always holds firm and rigid at Adams' faster working speeds.

See how Adams boosts your profit

Call or write and ask us to demonstrate any of the 6 Adams models, rated at 60 to 190 hp.

Every working day, this Adams 550 grader makes money for its owner, Harrison Construction Co., Pittsburgh, Pennsylvania. Here, building an earthen dam on the edge of a 45-acre settling basin for ARMCO Steel Corporation, near Butler, Pa., grader spreads a layer of fill for speedy compaction... for on-the-run spreading by earthmovers. "550" also keeps roads smooth to boost speed of dirtmovers hauling approx. 10,000 yds. daily, in two 9-hour shifts. Dam will be about 3000' long, 70' high, 410' wide at base, and 20' wide at top.

*Trademark G-1742-DCJ-1

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

Easier Pile Driving

Tests show electric current eases pile-driving friction

A pile driving technique, which uses relatively weak electric current flowing along the surface of a pile to reduce driving friction in a clayey subsoil, was tested on a laboratory model at the University of Florida, Gainesville. Reversing the current gives the pile a permanent "set" that greatly increases its load-bearing capacity.

The model was based upon field tests developed in Indonesia 10 years ago, which have only recently drawn attention in this country.

It is believed that the electric current ionizes the clay minerals in the soil immediately surrounding the pile, causing them to move away from it, reducing friction. The electric current is produced by attaching the negative side of a direct-current circuit to the metal pile at several places around its top, while the positive side of the circuit is grounded several feet away. The effect of the current in reducing friction during driving is almost immediate.

When the pile has been driven as far as desired, reversing the current has the opposite effect. The adhesion of the clay to the pole is increased and after a time water is removed from the immediately surrounding soil particles.

A model of the system was constructed by Robert Bayless and Leonard J. Langfelder, both civil engineering students at the University of Florida. J. H. Schmertmann, assistant professor of civil engineering, assisted in planning the model and demonstration.

The original discovery of this pile-driving method was made in the laboratory for soil mechanics and highway construction in the University of Technology, Bendung, Indonesia. It was tested in that country in following years and was published in the proceedings of the Third Annual Conference on Soil Mechanics and Foundation Engineering held in Switzerland in 1953.

In the Indonesian field tests, concrete piles with metal strips were used and were most successful with a saturated clay soil. Wood piles, it is reported, can also be driven in this matter when partly encased in metal.

In the laboratory tests at the University of Florida, a current of less than an ampere was sufficient to cause the ionization of clay particles.

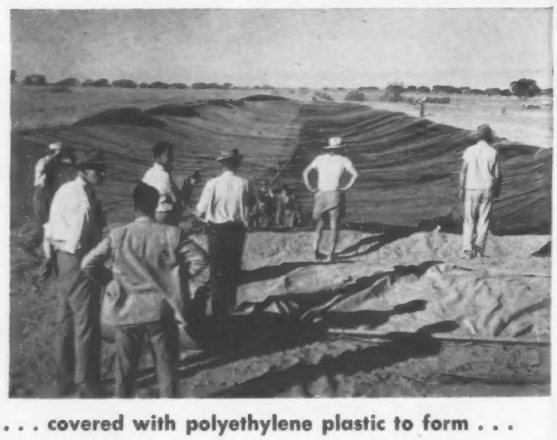
RPI to Offer Degrees In Environmental Engineering

Full programs leading to degrees in environmental engineering will be started this fall at Rensselaer Polytechnic Institute, Troy, N. Y. Explaining its action, RPI said, "Each year the requests for graduates for service in some phase of environmental control far exceed the supply. Environmental problems have been augmented by increased emphasis upon stream pollution control and air pollution control, together with the radiation and direct pollution conditions introduced by the rapid expansion of the nuclear industry."

RPI has established a four-year undergraduate course leading to the degree of Bachelor of Environmental Engineering, and a series of graduate courses leading to advanced degrees.

The new program, broader in scope than the field of sanitary engineering, will prepare students for careers in water supply, waste disposal, industrial safety and hazards control, community and industrial waste treatment and disposal, air pollution, environmental problems of nuclear industry, housing, food processing, etc.

600 x 80 ft reservoir is excavated and . . .



. . . covered with polyethylene plastic to form . . .

Leakproof Pond for Evaporation Tests

The Australian Commonwealth Scientific and Industrial Research Organization is constructing an experimental leakproof reservoir at Ouyen, Victoria, by scaling the bottom with a plastic sheet.

The reservoir is to be used in research tests aimed at reducing evaporation losses involving a thin film of cetyl alcohol spread over the water. By eliminating the problem of seepage losses, the evaporation losses can be determined more accurately.

The experimental reservoir, measuring 600 x 80 ft, is covered with two large sheets of polyethylene plastic (vis queen). The plastic sheets were spread over the bottom and sides of the reservoir and heat-sealed to form one piece. The plastic is waterproof and practically indestructible by chemicals.

Upon filling the dam with water, the CSIRO will be able to obtain complete information on the effects of temperature, sunlight, humidity and wind on the efficiency of the cetyl alcohol in reducing evaporation.

Builds expressway thru "city on 7 hills"

One of Foley's new B Fullpaks spreads dirt in smooth, controlled lift, building an approach to expressway overpass at Cincinnati. Fingertip operation of electric-motor-powered blade, apron, and positive-ejection tailgate gives precise control for fast accurate spreading.

Foley Construction Co., Cincinnati, works four 27-yd. B Fullpak scrapers, with two 25-yd. earlier "B's" and one 16-yd. C Tournapull, in a hillside cut for new 10-mile Cincinnati expressway. Fullpaks heap capacity loads in short 100′ cut, haul downhill to build overpass.

If you've ever been to Cincinnati, you'll appreciate the fact that building express highways there is a man-size job. Like old-world Rome, Ohio's "Queen City" is built on 7 hills. And its vast suburban expansion — continuing growth to the north, east, and west — extends into terrain perhaps even more rugged and hilly.

Moving 1,800,000 yds.

Across these hills, Foley Construction Co., Cincinnati, is building 3 sections of a 10-mile express highway for the State Highway Department. When completed, this new expressway will connect the Northeast Freeway with the main city area. Later, the highway will be extended into the downtown business section, and link with freeways to be built in northern Kentucky. Foley's contracts include 1,800,000 cu. yds. of dirtmoving . . . plus drainage, bridges, overpasses, and paving. Completion is scheduled for late 1958.

Hillside cut-and-fill

Contractor's 4 new LeTourneau-Westinghouse B Tournapulls® with 27-yd. Fullpak® scrapers — in company with two earlier 25-yd. "B's" and a 16-yd. "C" — are shown moving dirt on a city hillside, to build the approach to an overpass. Push-loaded, new "B's" got heaped capacity loads of sandy clay within a short 100′ cut. Dirtmovers hauled 1900′ on favorable grades, spread on the run, made sharp U-turns and quickly returned uphill.

Records show high output

Supt. Harry Combs reports that dirtmoving is ahead of schedule, says, "We're very well satisfied with our new B Fullpaks. They're giving us all the output we could expect from any scraper. And they've cut our costs at the same time." Contractor's records for the previous day show that on an average 2500′ haul, the 5 "B's" and one "C" moved 351 loads of dirt in 9 hours.

Fullpak bowl loads faster

Foley Constr. Co. finds the new Model B's with big, 27-yd. Fullpak bowls, pack full capacity, low-void payloads fast. Dirt flows easily into low, wide scraper bowl. Bottom has only 1° rise, so less power is required for *lifting* material. More pull force can be applied to *cutting* . . . and results in faster heaping of more pay-yards per load.

With the new "B" you also have a choice of 10-speed step-gear transmission, or Allison Torqmatic (torque converter with power shift) drive to best suit your normal working requirements. You pick the drive that lets you haul at highest speeds, get more loads per hour on *your* kind of work. Call or write for complete information.

BP-1633-DCJ-1

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

The A-W Hydraulic Crane... most versatile piece of equipment

according to D. R. Smalley & Sons, Inc., Celina, Ohio

D. R. Smalley & Sons, Inc., is a major Ohio road and excavating contractor. The company is now engaged in relocating a section of U. S. 40 north of Dayton. The project, entailing 1,400,000 yards of cut and fill and 20 miles of 2-lane pavement, is estimated to cost $4,800,000.

Francis Smalley tells us: "In 1955 we decided to buy an A-W Hydraulic Crane to assist with the maintenance work on our heavy construction equipment. It quickly proved its value on such jobs as changing transmissions on trucks and tractors and for lifting out and transporting engines to the shop for overhaul. It is also useful for removing crawler tracks and roller frames from tractors.

"We find many other uses, too, for this highly mobile unit. Loading and unloading materials such as barrels of fuel oil, curing compounds, and air entraining agents. In addition, we have found it very effective for laying reinforced concrete tile of up to 24-inch diameter.

"The A-W, in our opinion, is an exceptionally handy tool—our most versatile piece of equipment. Any contractor who does his own maintenance work will find dozens of jobs for it to do."

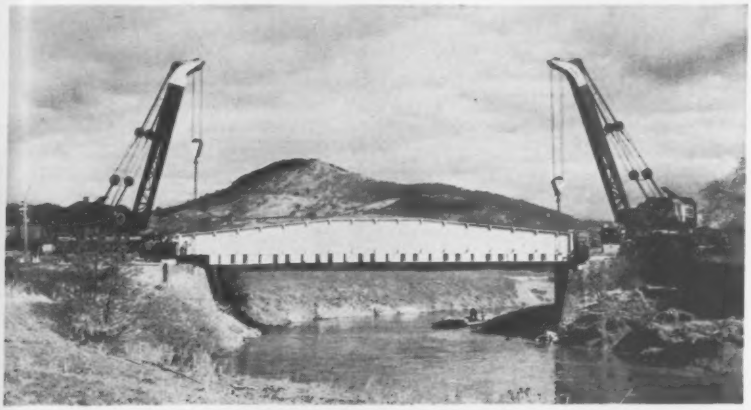
Find out how the A-W Hydraulic Crane can help you reduce downtime and build profits. See your nearby A-W distributor or write us.

Austin-Western CONSTRUCTION EQUIPMENT DIVISION, AURORA, ILL.

BALDWIN · LIMA · HAMILTON

Power graders • Motor sweepers • Road rollers • Hydraulic cranes

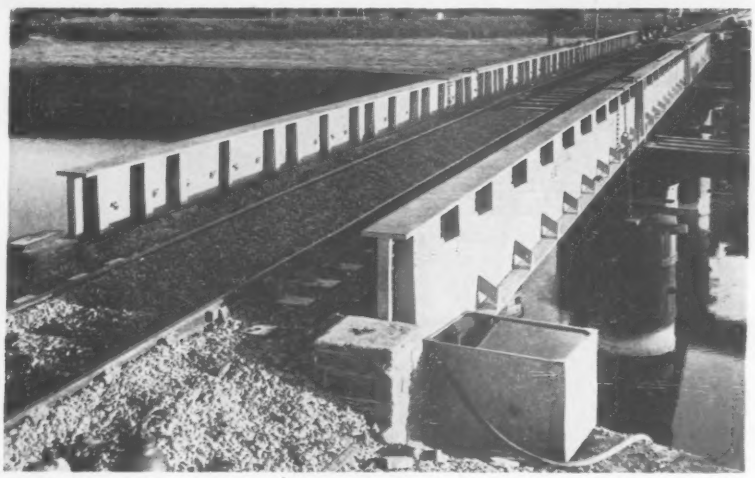
BALDWIN BLH LIMA-HAMILTON



STANDARD DESIGN RAILWAY BRIDGE is dropped into place at Pool Quay on the River Severn. Hog back girders improve appearance of the bridge.

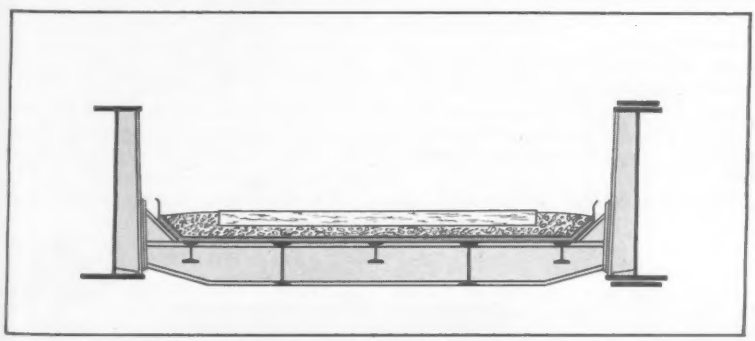
STEEL FLOOR UNITS go into position at girder stiffener points.

BENEATH BRIDGE shot shows bolting to main girder stiffeners.



NEARLY COMPLETE BRIDGE awaits only finishing of ballasting, bituminous waterproofing and painting at bolts through stiffeners.

Pre-fab Bridge Sections Go Standard



CROSS SECTION shows position of floor girders in relation to main girders. Floor unit shear plates are bolted to sloping flanges of the main girder stiffeners.

The Western Region of British Railways recently has adopted a standard design for half-through type, welded plate-girder sections spanning from 26 to 100 ft. Prefabricated steel floor units are the unusual feature of the new design.

The steel floor units have cross girders that rest on shear plates. These plates are bolted to the sloping flanges on the main girder stiffeners. Then, beneath each floor unit lies a steel trough that gives drainage for the ballasted track, in addition to providing steel decking that provides lateral stiffness to the span.

All parts are completely finished in

Post-tensioning girders with single Simplex pump and dual "Re-Mo-Trol" units.

Simplex Hydraulic Pullers Provide Greater Efficiency in Concrete Prestressing Operations

Construction Men Acclaim Ease and Safety of Simplex Methods

Concrete prestressing becomes a quick easy task with Simplex hydraulic equipment. Rods, wires and cables can be tensioned without torque, "off-center" pressures or complicated back-up devices because of the "center-hole" pulling feature of Simplex units. This accounts for a 75% increase in ease and efficiency.

The "Re-Mo-Trol" unit consists of a "center-hole" pulling ram connected to a hand, air, electric or gasoline powered hydraulic pump. The combination provides uniform stressing with maximum safety and speed. With the ram in place, the pump can be operated safely from any nearby location.

"Re-Mo-Trol" units are ideally suited for either job site or permanent prestressing bed use. Standard units are available from 10 to 100 ton capacities. They can be used directly on wires, rods or cables for high pressure tensioning, or for pushing or pulling against holding brackets in multiple bed stressing operations.

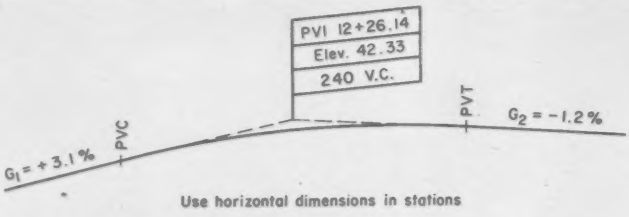
For detailed data on selection and application of Simplex equipment, write for Bulletin: "Hydraulic 56".

SIMPLEX "RE-MO-TROL" — Remote-Controlled Unit has ram connected to hydraulic pump by high pressure hose for safe, convenient use in tight spots and dangerous locations. The "JENNY" is a self-contained center-hole hydraulic puller which also serves as a press or heavy duty jack. It is available in capacities from 30 to 100 tons.

TEMPLETON, KENLY & CO.
2553 Gardner Road • Broadview, Illinois

the shop so that assembly at the site takes a minimum amount of skilled labor. Even the painting and waterproofing of the deck unit tops is a shop operation. After erection, a bituminous cover is laid and the bolts through the stiffeners are painted.

The railway's civil engineering department claims the standardization has benefited every branch of the department in providing increased efficiency. One, or at most two, sheets of new drawings are all they need for each bridge to be constructed. This results mainly in cut fabrication costs (since jigs can be reused) and in better workmanship through familiarity. At the site, erection becomes mechanical.



Use horizontal dimensions in stations

1. PVC = 12.2614 − 1/2 × 2.40 = 11.0614
   PVC Elev. = 42.33 − (1.20 × 3.1) = 38.61
   PVT = 12.2614 + 1/2 × 2.40 = 13.4614
   PVT Elev. = 42.33 − (1.20 × 1.2) = 40.89

2. $A = \frac{(-1.2)-(+3.1)}{2 \times 2.4} = -0.8958333333$

   $B = 3.1 - [2 \times (-0.8958333333) \times 11.0614] = +22.91834167$

   $C = 38.61 - (22.91834167 \times 11.0614) - (-0.8958333333 \times 122.3545700)$
   $= 38.61 - 253.5089445 + 109.6093023$
   $= -105.2896422$

3.

Sta.	Sta.^{2}	A × Sta.^{2}	B × Sta.	Elev. = A Sta.^{2} + B Sta + C
11+50	132.25	−118.474	+263.561	39.797
12+00	144	−129.000	+275.020	40.730
12+50	156.25	−139.974	+286.479	41.215
13+00	169	−151.396	+297.938	41.252

Grade at PVI = 2 × (−0.8958333333) × 12.2614 + 22.91834167
= +0.95 %

How to Speed Up Vertical Curve Design

"Long vertical highway or railroad curves of an off-beat length and beginning at uneven stations have never been warmly regarded by the stakeout party or by the poor unfortunate who must compute the elevations along such a curve," says Lester A. Abbey, Jr., of Chas. H. Sells, Inc., New York City consulting firm.

To relieve some of the computing usually associated with such curves, Mr. Abbey has proposed a computation method for the problem which eliminates the subtraction of tangent corrections.

In essence he has started with the equation for a parabola. Differentiation of this equation gives the slope of the parabola at any point. Differentiation a second time gives the rate of change of slope at any point in the parabola.

(1) $y = ax^2 + bx + c$
(2) $dy/dx = 2ax + b$
(3) $d^2y/dx^2 = 2a$

Now, assuming the origin of the x-y coordinates to be the same as the zero stationing and the zero elevation, and knowing the station and elevation of any point on the curve (PC for example), the slopes at PC and PT, and the length of the curve; one can—by use of a 10 place calculating machine—compute the constants a, b and c in the general equation. Knowing the constants in the general equation (1) will permit easy calculation of the station and elevation of any point along the curve. Grade at any point along the curve can be computed by eq. (2).

The illustrative example shown above will make this method clear:

Given: a vertical curve of the following dimenisons.

Length	240 ft.
g_1	+ 3.1%
g_2	− 1.2%
PVI Sta.	12 + 26.14
PVI Elev.	42.33 ft.

Plenty of room for seven large vehicles in this 36' x 112' Stran-Master.

FOR LOW-COST VEHICLE STORAGE . . .

CHOOSE A Stran-Master GARAGE

If your transportation department needs service and storage space—give them firesafe, all-steel housing that meets present demands and easily expands in size later. The Stran-Master building that can do this will cost 30% to 50% less than most other types of construction. And Stran-Steel's five-year purchase plan calls for only one-fourth down. You can own more cheaply than you can rent!

Handsome Stran-Masters also serve as warehouses, factories, retail outlets, utility houses and service shops. Need an inexpensive, low-maintenance building of your own to improve your operation? The production-built, precision-engineered elements to fit your needs can be quickly shipped for fast erection—choice of do-it-yourself construction or dealer's crew.

For all the facts, send for our illustrated catalog or see your Stran-Steel dealer. He's listed in the Yellow Pages under *Steel Buildings* or *Buildings—Steel.*

Exterior view of attractive low-cost Stran-Master building used for commercial vehicle storage.

Dept. 27-27

Stran Steel

STRAN-STEEL CORPORATION

Detroit 29, Michigan • Division of

NATIONAL STEEL CORPORATION

Stran-Steel Corporation, Dept. 27-27
Detroit 29, Michigan

Send me the new Stran-Master Catalog. Please quote down payment needed for _____ x _____ Stran-Master building to be used primarily for: _____

_____

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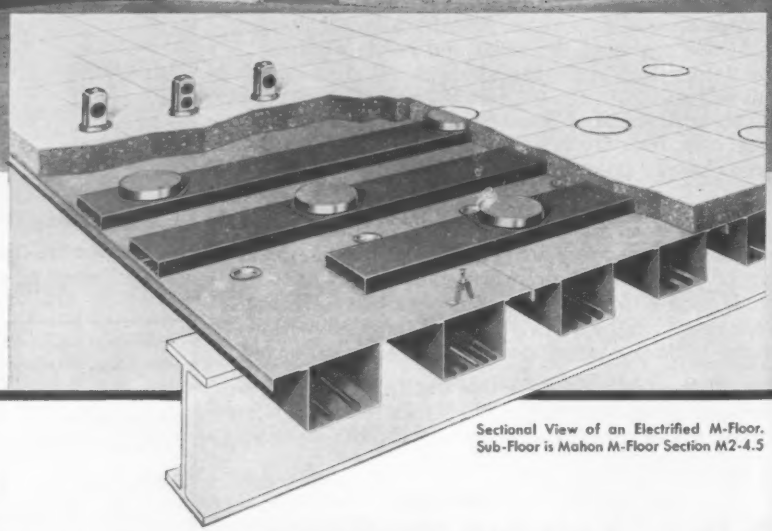
COMPANY_____

ADDRESS_____

CITY_____ ZONE____ STATE_____

Mahon M-FLOORS Give Yo lect

Mahon M-Floor Construction was employed throughout in this Modern Office Building for the Manhattan Building Company, Toledo, Ohio. Bellman, Gillett & Richards, Architects. Geo. W. Lathrop & Sons, Inc., Gen. Contrs.



Sectional View of an Electrified M-Floor. Sub-Floor is Mahon M-Floor Section M2-4.5

Serving the Construction Industry Through Fabrication of Structu
Steel, Steel Plate Components, and Building Produ Steel

Yo lectrical Raceways Under Every Sq. Ft. of Floor Surface—Provide Greater Raceway Capacity!

Deep M-Floor Sections on Longer Spans Save Structural Steel . . . Reduce the Over-all Weight of a Building

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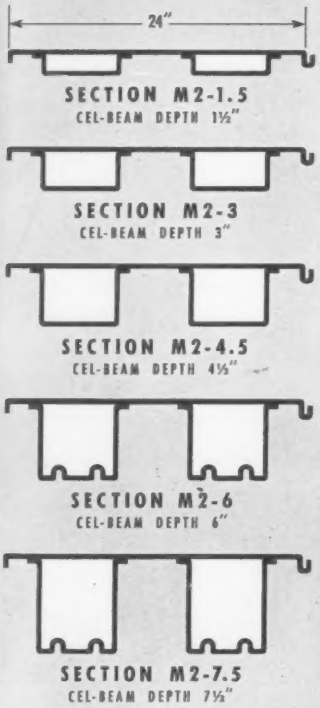

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- Insulated Metal Curtain Walls
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- Rolling Steel Doors (Standard or Underwriters' Labeled)
- Steel Roof Deck
- Long Span M-Decks (Cellular or Open Beam)
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- Acoustical Metal Ceilings
- Structural Steel—Fabrication and Erection
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☆ *For INFORMATION See SWEET'S FILES or Write for Catalogues*

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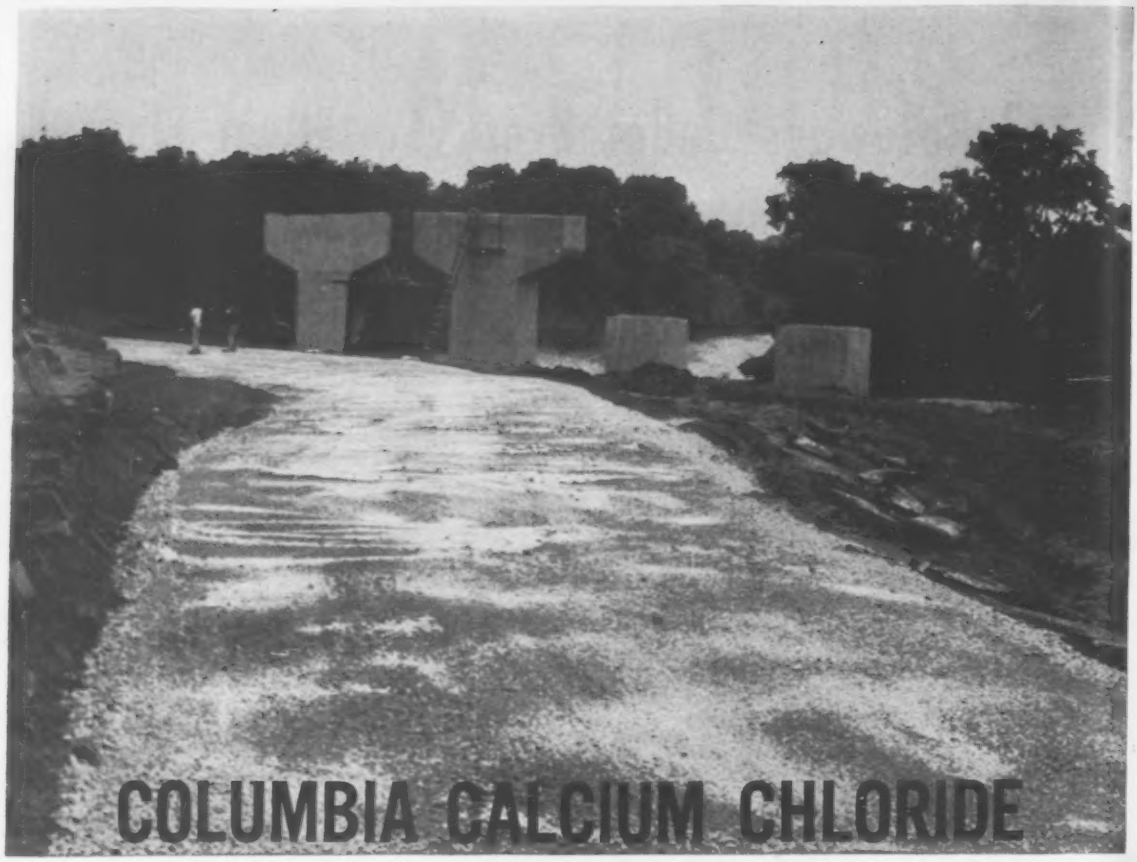


KEEPS DUST AND COMPLAINTS DOWN

Dust caused by heavy equipment, earthmoving, and other work creates public relations problems. Municipalities, near-by residents, and traffic don't like it. Your own crews don't like it. Efficiency goes down, and opportunities for costly accidents are opened.

Construction site dust can be controlled very inexpensively with Columbia Calcium Chloride. This "thirsty" chemical absorbs moisture from the air to keep soil slightly damp. Spread it through and immediately around working areas, in parking spots, and over detours and by-passes.

Columbia Calcium Chloride works as effectively for stabilizing road shoulders and dense-graded aggregate bases. Traffic-bearing surfaces are ready faster, and materials are preserved.

Structural concreting schedules can be cut days when Columbia Calcium Chloride is part of the ready mix. Initial and final set meet strength specs up to twice as fast as untreated concrete. Finishers aren't held up, forms can be pulled for the next job.

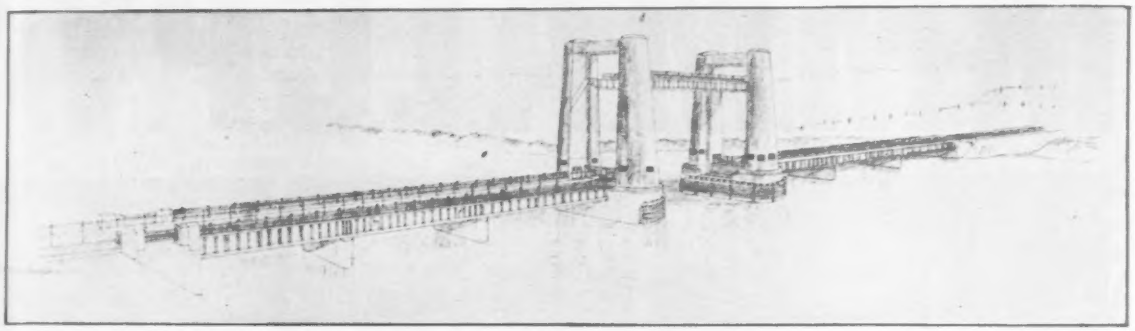
Contact your nearest Columbia-Southern District Sales Office today for quick delivery.

Available in two forms—
High Test Flake (94-97% $CaCl_2$)
and Regular Flake (77-80% $CaCl_2$).

COLUMBIA-SOUTHERN CHEMICAL CORPORATION

A Subsidiary of Pittsburgh Plate Glass Company

One Gateway Center, Pittsburgh 22, Pennsylvania. DISTRICT OFFICES: Cincinnati, Charlotte, Chicago Cleveland, Boston, New York, St. Louis, Minneapolis, New Orleans, Dallas, Houston, Pittsburgh Philadelphia, San Francisco. IN CANADA: Standard Chemical Limited



Lift Span to Link Island With British Mainland

Work will start shortly in Great Britain on a new $3.2 million highway and rail bridge between the Isle of Sheppey and the Kentish mainland. It will have a 120 ft lift span at the center and six other spans totaling 650 ft in length.

Located in the Thames estuary, southeast of London, the Isle of Sheppey is separated from the mainland by a narrow sea arm called the River Swale. An existing bridge, which is adjacent to the new site, will be demolished after the new crossing has been opened to traffic in 1960.

The new bridge will have steel girder spans, supported on reinforced concrete piers. It will carry a 24 ft roadway, a single-track railway and a 6 ft sidewalk.

Prestressed concrete will be used for the lift-span towers. The lift span in raised position will clear high water by 95 ft.

John Howard & Co., Ltd., of London, will build the bridge. Consulting engineers are Mott, Hay & Anderson, also of London.

Bulldozers Hew a Spiral Out of Caracas Hill

What was a 25 acre hill in Caracas, Venezuela, has been transformed into a sharply chiseled spiral ramp on which a shopping center and its access roads will be built.

The Helicoid—as the $25 million development will be called—will feature a winding road, rising on a 2½% grade, lined with shops (ENR April 25, 1957, p. 83).

Work began last February, commencing at the top of the hill, and nearly all of the required 1.6 million cu yd of cut have been excavated. Cuts were made with bulldozers, except for outer edges of ramps, which at some points were excavated by hand or with tractor-shovels. Rock was blasted at some

M.M.M.A.L.C.P.Y.*

HENDRIX
DRAGLINE BUCKETS

"A Type for Every Digging Purpose"...
¼ to 40 Cubic Yards-Perforated or Solid

Hendrix Lightweight Dragline Buckets

HENDRIX MANUFACTURING COMPANY, Inc.
MANSFIELD, LOUISIANA

***MOVE MORE MATERIAL AT A LOWER COST-PER-YARD**

points with small dynamite charges (three or four boxes) tamped in shallow holes (up to 6 ft deep). Danger of damaging nearby buildings ruled out heavier charges. Cuts average 23 ft in height and range from 20 to 66 ft in width.

The hill is composed mainly of schists, with some calcareous and graphitic strata. Foliation planes in the schist are steeply inclined, ranging from 45 deg from the horizontal at the lower cuts to 80 deg at the top. The hill is isolated, and there is no ground water within working depths on the site.

Although there have been some small slides during the work, none have involved more than about 130 cu yd, and the soil is believed firm enough so that there is no danger of a large slide. Falling rocks are stopped by mesh fences strung around the hill at intervals.

Vertical cuts eventually will be faced with concrete, but anchorage details of the facing have not yet been worked out. Building foundations are still under study, too. It is likely that most of them will be cast-in-place concrete piles.

Designed by Venezuelan architect Jorge Romero Gutierrez, the shopping center will be constructed by Inversiones Planificadas Corp. Excavation is being done by Ingenieros Venezolanos Corp. (IVECA).

Far North's First Phones Are Big Construction Job

An end to isolation of many small Alaska communities was accomplished –at least partly–last week with the putting in service of the U.S. Air Force "White Alice" telephone and telegraph network. Designed to serve outlying areas, primarily as a communication link in the national defense radar warning system, the network marks an end to reliance on "bush radio" stations for contact with the outside world.

The 3,000 mile system, which operates on a new radio-relay principle, employs huge antennas resembling outdoor movie screens that send signals up to 170 miles between stations in a single hop.

About 3,500 persons took part in the construction of the network, with Western Electric Co. as the prime contractor for the system. Some 33 stations were built to relay the messages. And in building the stations, many of which are on mountain tops, helicopters were used to gain access. Work also involved building air strips to receive cargo planes and access roads to get to the jobsites. The job took nearly three years to complete.

Big Power Dam Planned On Hungarian Danube

Hungary has announced plans for a "giant" power dam on its stretch of the Danube River near Nagymaros to get under way in 1959. It is scheduled to be completed in 1966 and is to produce 10% of the country's power requirements. No definite capacity was given, only the promise that the dam's power will supply 1.5 million homes.

The scheme is to include twin 750 ft long locks, presumably of similar width to the locks the Austrians built at two of 15 planned power structures across the Austrian Danube.

Caribou Falls Set for '58 Completion

Construction is nearing completion on the 67,500 kw Caribou Falls development on the English River in northwest Ontario, Canada. Its builder, the Hydro-Electric Power Commission of Ontario, expects to have all three units on the line by October, 1958. The main dam structure extends 1,260 ft across the river.

(*International continued on p. 84*)

Today's Modern Water Tanks Prestressed Concrete Type

Long and Short Term Economies Making Them Popular

A modern prestressed concrete tank is not only economical in first cost, but because of its almost maintenance free character, offers any municipality real long term economy. Any tankage engineering study should include calculated maintenance costs over the estimated life of the facility. Average yearly maintenance on a 3,000,000 gallon steel tank is estimated at $2500 per year at current prices. For a prestressed concrete tank, maintenance is negligible; however, occasional painting for color effect may be desired.

When the charges for servicing the initial cost plus relative maintenance allowances are plotted, the prestressed concrete tank will often show a lower out of pocket cost to the owner in less than 5 years. When these costs and

their increases are extended for an expected service life of 50 years, the savings to the owner with prestressed concrete are enormous.

The prestressed concrete tank is also a good looking tank . . . it is inherently strong and extremely stable . . . it is designed and built for permanence. And, 75% of the contract price is spent right in your local community . . . construction is done with materials and labor available locally.

Write today for more information on Preload Prestressed Concrete Tanks.

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PRELOAD CONCRETE STRUCTURES, INC.
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28400 Clawiter Road, Hayward, California

THE PRELOAD COMPANY, INC.
Jefferson Tower Bldg., 351 Jefferson, Dallas, Tex.

Do You Have This PIPE PROTECTION PROBLEM?

Underground piping must be protected against destructive forces of corrosive soils and electrolytic conditions. Normally, coal tar coating as called for in AWWA specifications C-203 and C-204 would be hot-applied at a coating mill. However, there are times when the volume of pipe involved or the distance of a coating mill make this impractical from a time and cost standpoint.

You'll find the ANSWER with TAPECOAT . . . the Quality Coal Tar Coating in Tape Form

TAPECOAT is the widely-accepted alternate material that is equivalent to mill-applied hot coal tar protection. With this easy-to-use material, protection can be applied in the field by your own men, because technical know-how, kettles and special crews are not required. You save time and money while providing the long-life protection called for.

TAPECOAT is easily applied, using a torch to soften or bleed the pitch which gives both bond and protection. Available in widths from 2" to 24", it is spirally wrapped or cigarette wrapped around pipe, pipe joints, couplings, conduit, cable, and insulated piping.

Write for illustrated brochure.

The TAPECOAT® *Company*

Originators of Coal Tar Coating in Tape Form

1551 Lyons Street
Evanston, Illinois

Eastern Publishers Service Photos

PARKING APRON works proceeds at Gatwick Airport. New facility will provide alternate for crowded London airport. Terminal is modern design for comfort and utility.

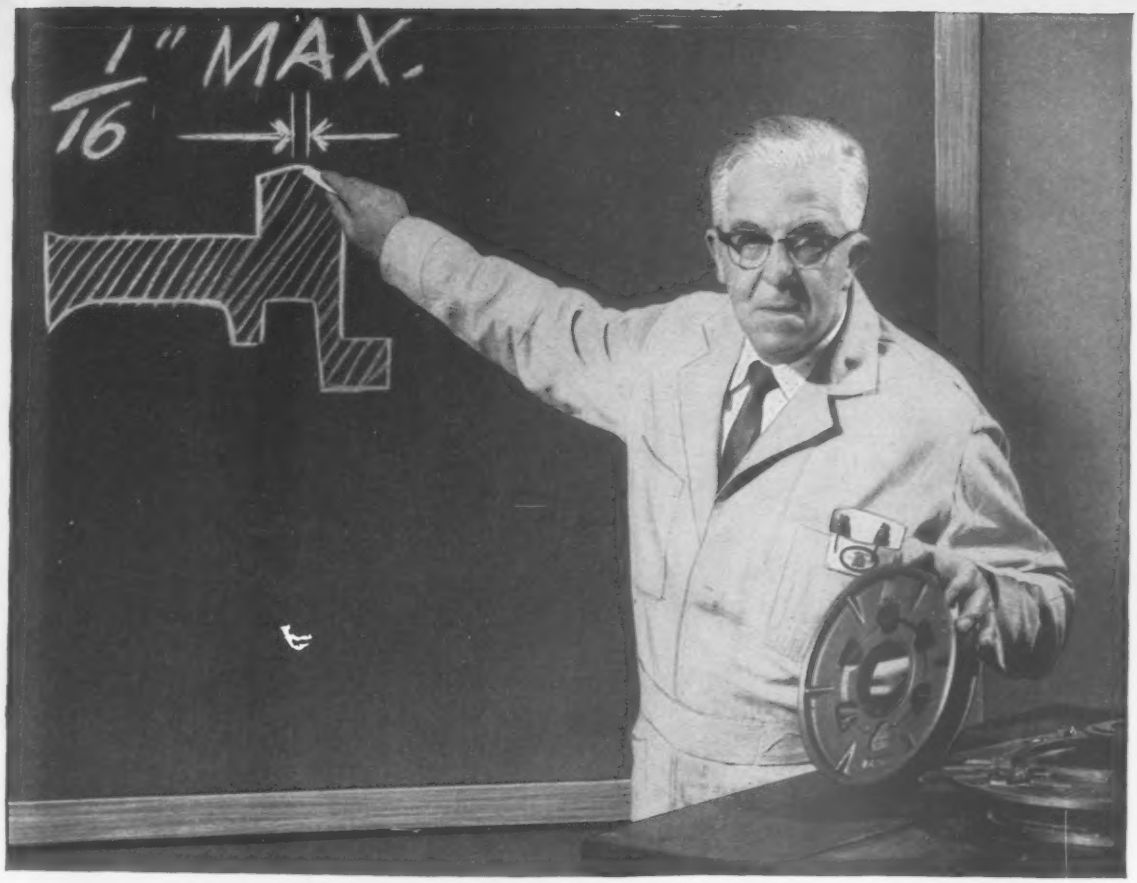
TERMINAL BUILDING takes shape as reinforced concrete structure rises. Railroad tracks (arrow) tie new terminal to London and will provide quick connecting transportation.

London Alternate Seen in New Airport

A new airport is being built at Gatwick, 20 miles south of London, to serve as a bad weather alternate and overflow outlet to the existing London airstrip. The new airfield will serve all types of aircraft—even jets at landing and at light-load take offs.

The new site tends to have better visibility than London, yet remains close enough to be accessible by both road and rail. Though operations are expected to reach a maximum during the summer months, when holiday traffic is greatest, the field will be in use all year long. Both trains and autos will be able to unload passengers directly at the terminal building, to insure greater convenience.

The plans are to make Gatwick one of the best-equipped airports in the world. Latest radar devices will be used. The widely-used Calvert center line-and-bar approach lighting system will be laid down at the runways. And run-



This field-rebuilt clutch "died" too soon—

Here's why: **A field rebuilder re-used the adjusting plate with worn-down fulcrum edges.**

The limit of wear permissible is reached when the *width* of the fulcrum edge hits 1/16". Beyond this point, the depth of metal beneath the edge is insufficient to retain the proper clutch lever ratio.

The result is lowered torque capacity, chatter, slipping, overheating of the reassembled clutch . . . and—in this case—*a loss of 30,000 miles in clutch life!*

For Lipe Dependability . . . Go to Lipe!

For a clutch built to Lipe specifications and under Lipe quality controls . . . a clutch produced by factory-trained workmen on factory production machinery . . . balanced with costly electronic devices . . . and inspected with Lipe close-tolerance testing facilities . . . go to Lipe.

All Parts in Lipe Clutches Conform to High Precision Standards

From our experience in supplying clutches to 54 makers of heavy duty equipment comes the know-how that goes into the manufacture of the Lipe Guaranteed Clutch. That is why we can unconditionally guarantee our product to be unequalled by field rebuilders.

Look for this Factory Seal when you take delivery on a Lipe Guaranteed Clutch for replacement service. It is your assurance of long, trouble-free life and *big* long-run savings!

SEND FOR OUR FREE "Clutch Facts" Booklet

Tells you how to get more life from your heavy-duty clutches and what to look for when replacing them.

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Lipe-ROLLWAY
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SYRACUSE 1, N. Y.

An "Automatic America a new

Chevrolet – Dodge – Ford – GMC now offer the Allison Fully Automatic Truck Transmission

- A Rocky Mountain trucker cuts engine maintenance 50%
- A West Coast contractor hauls 33⅓% more payload per trip
- A Utah ore hauler cuts brake maintenance 75%
- A Michigan car-haul drives 100 extra miles per day
- An Eastern sand hauler makes 3 trucks do the work of 4

Allison

Brain" brings kind of Truck

No wonder truckers call the Allison Fully Automatic Truck Transmission "the most important development in 30 years for faster, safer, lower-cost trucking!"

No wonder four leading truck makers have engineered the Allison Automatic transmission into their newest medium and heavy-duty trucks.

The Allison Automatic can pay for itself in a year — pay for itself 5 to 10 times over during the life of your truck. It actually gives you *a new kind of truck.*

It's more than a truck transmission —it's an "Automatic Brain"

On busy delivery routes, or over the open road, the driver simply selects the range. Then, the Allison "Automatic Brain" takes over.

It begins by multiplying engine torque 15 times. Out of mud and mire, up the steepest grade, the power to move the load is there—instantly!

It automatically senses the precise gear for any situation. Shifting is automatic—exact—every time.

Your engine can't lug or race. The Allison Automatic is virtually abuse-proof. It protects drive lines from shock loads—protects you from repair bills.

Its built-in Hydraulic Retarder saves you more than 50% on brake maintenance.

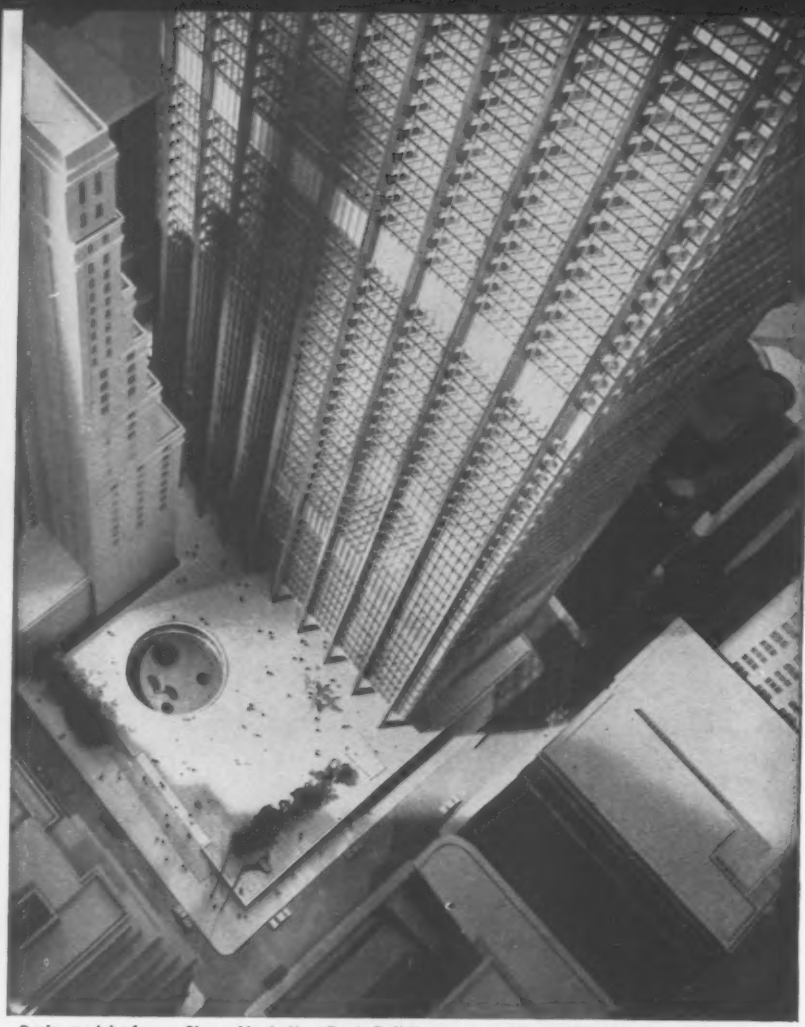
The Allison Automatic is the first automatic transmission specially designed to make full use of today's modern, high-torque engines—the only fully automatic transmission specially designed for medium and heavy-duty trucks.

It was born out of more than 10 years of service in the heaviest military and off-highway vehicles.

The Allison Fully Automatic Truck Transmission can repay its modest cost many times over in *your* trucking operation. See your dealer in Chevrolet, Dodge, Ford, and GMC. Or write:

ALLISON DIVISION OF GENERAL MOTORS, Indianapolis 6, Indiana

FULLY AUTOMATIC TRUCK *Transmissions*



Scale model of new Chase Manhattan Bank Building, now under construction in down-town Manhattan. Foundations for this structure will be set in solid rock, 85 feet below street level.

GYRO-FLO *in the new*

3300 cfm of Gyro-Flo Air Power Helps Prepare Excavation for New Skyscraper

In downtown Manhattan, New York Cit there is in progress "the" most difficult foun dation job in the world – The Chase Manha tan Bank Building Foundation. The sixt story edifice of steel and glass will be set on foundation carried down to and into solid be rock, at a depth of 85 feet below street leve

The foundation construction, the most im portant phase of the complete project, is pro gressing rapidly under the skilled managemen of The Foundation Company, George M. Brew ster, and Joseph Miele Construction Co. wit Lou Miller as project manager, Gene Fullan General Superintendent.

SIDEWALK SUPERINTENDENTS

To the "sidewalk superintendents" who dail help oversee the job, Ingersoll-Rand Gyro-Fl compressors have been a familiar sight. Whe the job first started, there were five of the down in the big open pit (one 900 cfm an four 600 cfm units) supplying 3300 cubic fe of air per minute for the drilling operation. A the job rapidly progressed and the need for a decreased, three of the 600 cfm units we taken off the job and placed at another.

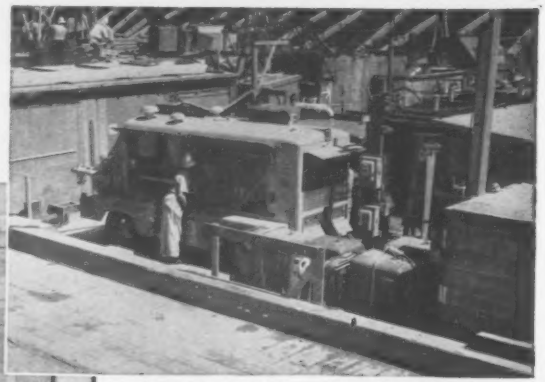
Not so conspicuous, but equally importan are the rock drills which operate deep belo the surface. Line-hole drilling, four holes t the foot, is accomplished at a rapid pace b Ingersoll-Rand DB35 drifter drills with JH Wagonjack mountings on 20-foot quarry bar

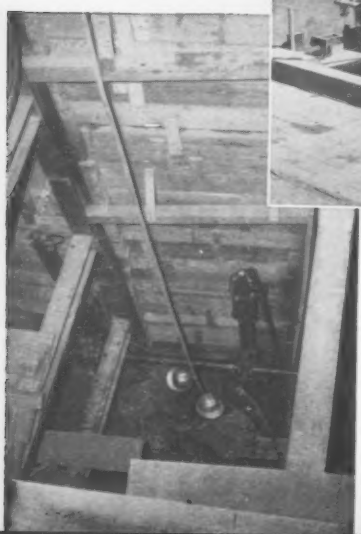
WINNING COMBINATION

This combination – Gyro-Flo air power an I-R rock drills – has helped building contra tors meet the tightest schedules on major job all over the world. Gyro-Flo rotary compre sors, available in sizes from 85 cfm to 900 cfm deliver a constant supply of 100 psi air wit practically no attention or maintenance. Thei on-the-job dependability has become the stand ard by which all others are judged. And thei rugged all-weather construction keeps them o the go under the most severe atmospheric an climatic conditions.

For information on how Gyro-Flo air powe can help you speed up construction and avoi costly delays, just call your nearest Ingersoll Rand representative.

The 900-cfm Gyro-Flo portable compressor shown in the foreground heads a line-up that includes four 600 cfm units, only the tops of which can be seen.





Line-hole foundation drilling, four holes to the foot, is being done with this quarry-bar setup using Ingersoll-Rand DB35 drifter drills on JHM Wagonjack mountings.

Ingersoll-Rand

2-727 11 Broadway, New York 4, N.Y.

AN UNBEATABLE COMBINATION... GYRO-FLO COMPRESSORS AND I-R ROCK DRILLS

ways themselves are designed to handle the heaviest of aircraft to be expected in years ahead.

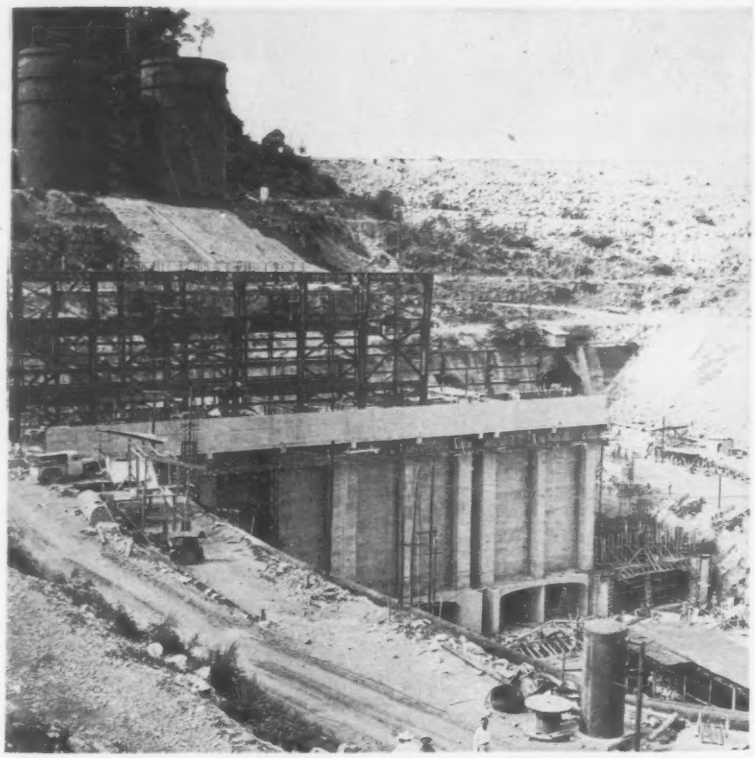
Construction is being carried out in two stages. The first, to be completed by early spring or summer, is building the basic facilities on 660 acres of land with one main runway some 7,000 ft long. It includes taxiways, aprons, a terminal building, control tower and an aircraft maintenance area. The second would add a 6,000 ft runway and a 4,000 ft runway whenever traffic conditions warranted.

Winter Shipping Pushed On Lower St. Lawrence

Businessmen in the Gulf of St. Lawrence region in eastern Canada have established an association whose prime effort will be to promote year around navigation on the lower St. Lawrence.

Although there have always been intrepid steamer captains who have made winter voyages down the Gulf, such sailings have never been on an established basis. But now the 700 mile stretch between the Saguenay River and the open Atlantic has a number of great industries which depend upon shipping in the Gulf. Among these are paper mills, aluminum works and the well publicized iron ore project at Knob Lake with its 360 mile railway to port (ENR p. 38 Sept. 11; p. 38 Sept. 18, 1952).

Name of the new body is the Lower St. Lawrence and Gulf Development Association. Its general manager is Huet Massue, long connected with Shawinigan Water & Power Co. and a director of Atomic Energy of Canada, Ltd.



Mexico's Papaloapan Power Project

Facilities for generating 154,000 kw of hydroelectric power are being installed at the Papaloapan Power project near Temazcal, Mexico. At a cost of $32 million the Mexican Government is completing a 2,732 ft long, 225 ft high clay core rockfill dam to control flooding of the Papaloapan River Basin. The powerhouse shown will contain four generating units of Swiss manufacture. Constructora El Aguila, S.A., Mexico City, is the main contractor. Chicago Bridge & Iron Co., Chicago, directed installation of the penstocks liners and surge tanks seen at top.

(*International continued on p. 90*)

SINGLE ACTING PILE HAMMERS

Heavy blows — low rate of speed — for driving big, heavy piles steadily and surely — and for driving any pile through heavy, rubbery soil — Sets and meets single-acting specifications—write for details!

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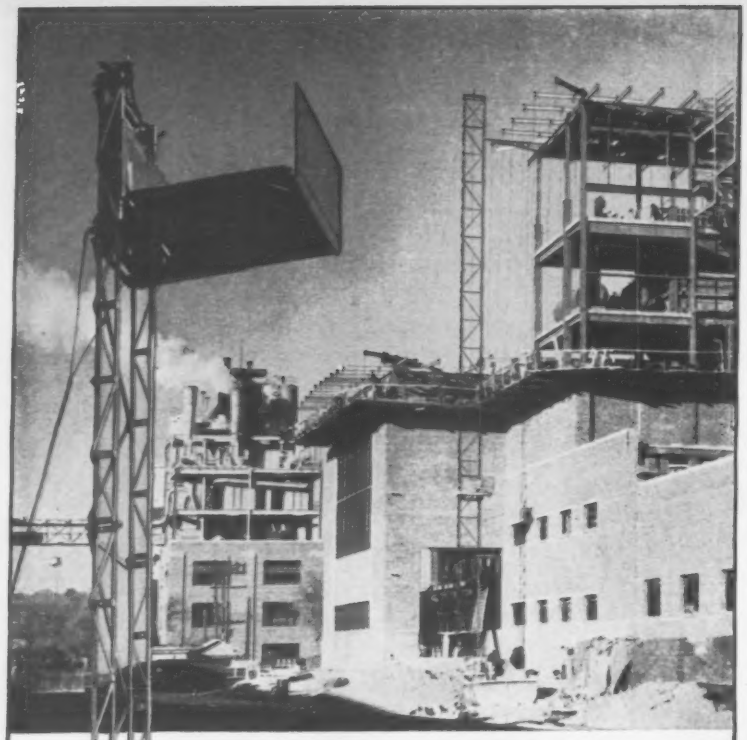

ILLUSTRATED: The Kaw Power Station built by the Patti Construction Co. of Kansas City. No small part of the firm's success is their enthusiastic ownership of 4 BUCK hoistowers.

the BUCK hoisTower

With increasingly competitive bidding, the contractor who owns a BUCK—has his competitors beat going in.

From 2 stories to 10 and more the BUCK hoistower is the best, safest and most economical method of raising building material to the exact level where it is needed.

The portability, mobility and strength of the BUCK leaves no actual competition in the field of material hoisting.

Ready-rigged and self-erecting to a working height of 45 ft., it is moved, placed and erected in matter of minutes. Raises 2500 lbs. at 170 ft. per minute.

Concrete Buckets — Chicago Booms and other special Accessories guarantee it the most versatile rig a contractor can have.

Tow it right to the jobsite.

Ready-rigged tower unfolds like a jack-knife.

Because the Hoistower arrives on the job completely assembled—ready-rigged—ready for work—it can be spotted, unhitched and in operation by one man in just 23 minutes.

•

The Tower is constructed of hard drawn seamless tubing, which is far superior in strength to dead iron, such as pipe, channel or iron. Extra 5 and 10 ft. sections may be added to the Tower for additional height.

•

No climbing is required in the erection of a Buck Hoistower up to 45 ft., 90% of all building construction is under this height, and the BUCK is right at home on the remaining 10% —see illustration.

We will gladly send you more complete information and/or arrange a demonstration at no cost to you and at your own convenience.

B BUCK EQUIPMENT CORP.

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Five-Mile-Long Explosion Planned for Russian Canal

With a single explosion Russian engineers plan to blast a new channel 5 miles long in the bed of the Angara River at the 3.6 million kw Bratsk Hydro project. About 90 million cu yd of rock are to be shifted by the blast.

The new channel would allow the huge reservoir behind Bratsk Dam, now under construction, to be filled quickly without interrupting navigation on the lower reaches of the river. It would allow the project to begin operation two years earlier than planned.

About 30,000 tons of explosive are to be laid in a tunnel underneath the river. The big explosion is set for some time in 1959.

The dangerous tremors of the explosion will spread for only a mile from the center of the explosion. The water ram will be quickly absorbed in Lake Baikal and the branches of the Angara.

Japanese Push to Enter Australian Construction

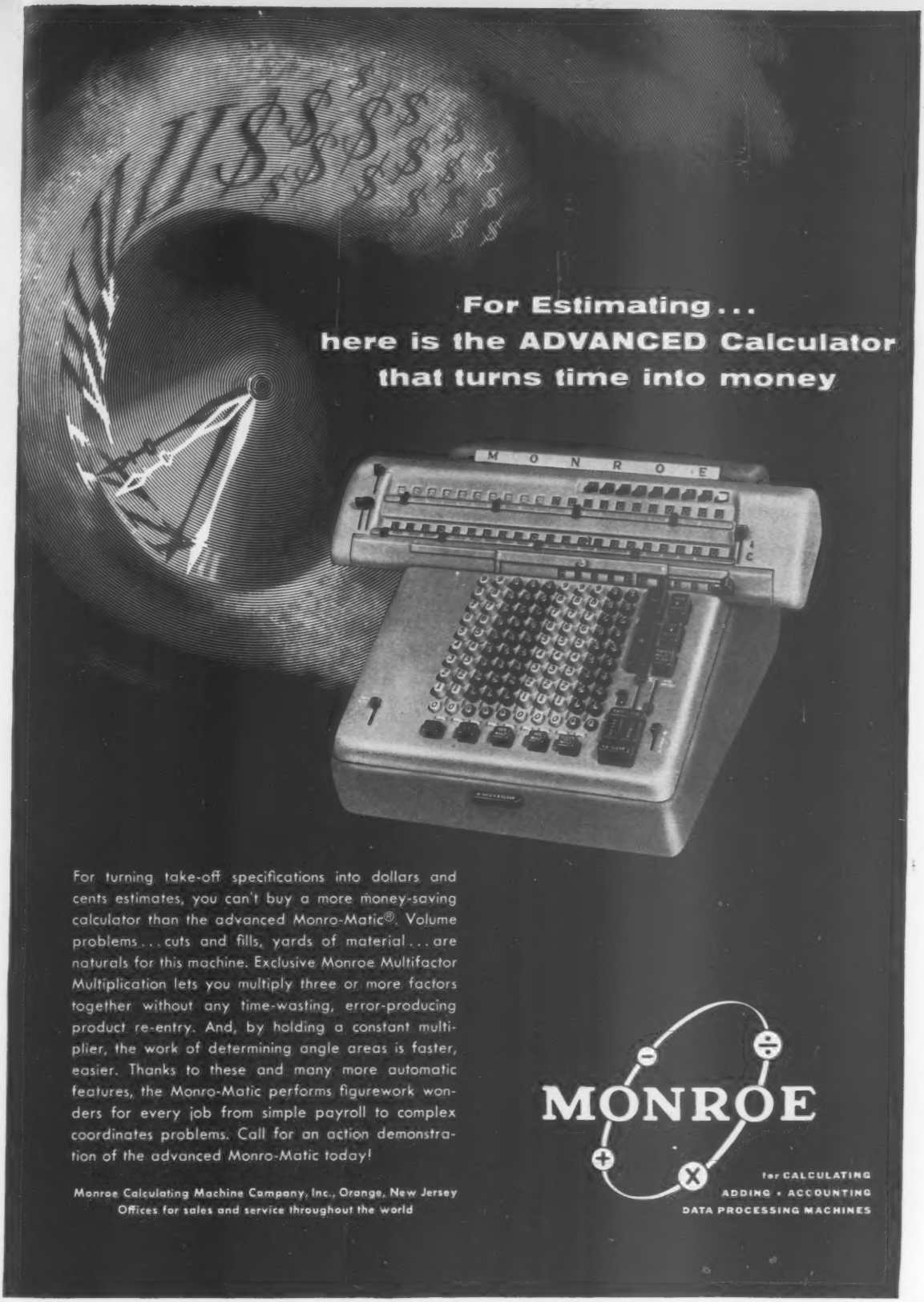
Japanese construction firms are measuring the size of the Australian construction market. Their aim: to move in on the lucrative business now mostly in the hands of U. S. and Italian companies. They have a particular interest in getting a share of the huge Snowy River hydroelectric development, and a number of Japanese firms are prepared to join forces. Feelers also have been extended by the Japanese for railroad projects, some big bridges, one underground railroad job and several electrical generation projects.

The Japanese have been aided by their diplomatic corps, not unusual in the international market (ENR Nov. 14, 1957, p. 25). Their diplomatic lever is Japan's great importance to Australia as a buyer of wool. Against them at the moment is the impending Australian election, as it would be an unpopular move for the government to allow Japanese contractors to enter the country with the second World War so fresh in the minds of Australians.

Other drawbacks are the language barrier and the unwillingness of Australian workers to serve under the supervision of Asians.

But diplomatic pressure is being aided by another potent weapon—price. Japanese construction firms repeatedly have hinted that their bids may be as much as 25% below those of U. S. firms. Because of these factors, the Australian government may find itself unable to refuse entry to the Japanese firms.

(*International continued on p. 93*)



For turning take-off specifications into dollars and cents estimates, you can't buy a more money-saving calculator than the advanced Monro-Matic®. Volume problems... cuts and fills, yards of material... are naturals for this machine. Exclusive Monroe Multifactor Multiplication lets you multiply three or more factors together without any time-wasting, error-producing product re-entry. And, by holding a constant multiplier, the work of determining angle areas is faster, easier. Thanks to these and many more automatic features, the Monro-Matic performs figurework wonders for every job from simple payroll to complex coordinates problems. Call for an action demonstration of the advanced Monro-Matic today!

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Offices for sales and service throughout the world

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DATA PROCESSING MACHINES

Self-propelled Tractairs with attachments "give us mobility and utility we never had before," says Supt. Anglin. "Without them, we would have a tough time keeping up with the booming demand for water service."

Tractairs* Save $24,000 a Year in Labor Costs

"We can put in water service lines 300% faster with Le Roi tractor-compressors," water dept. superintendent reports

Three self-propelled Le Roi Tractairs with attachments slashed the annual cost of labor for laying and maintaining water service lines from $32,000 to $8,000. That's the report of Charles Anglin, Superintendent of the Water Dept., Mansfield, Ohio.

Today, Anglin explains, four men with a Tractair finish a water-tap job in four hours. In the past, the same job tied up ten men, a truck, and a portable compressor for two days. That's quite a saving when you consider that Mansfield installs 500 new water taps each year.

Rely Solely on Tractair

Water-main repairs are routine jobs now, he adds. "We can fix a break and restore service 50% faster than before we had the Tractairs," he explains. That's because the Tractair gets to the site in record time — brings the air supply and all the tools needed under its own power.

The LeRoi unit breaks the surface. It digs the trench with its back hoe attachment while water is flowing, and powers the sump-pump to remove excess water. After the break is repaired, the backfill blade is used to refill the trench. Tampers pack the fill, using air from the Tractair.

Each Tractair replaces four pieces of equipment, some of it rented — when available — at $15 an hour. Labor, at $2 per man/hour, is reduced from ten men to four. And, since the Tractair is self-propelled, there's no waiting for equipment to be hauled to or about the site.

Provides Many Benefits

The utility and mobility of the Le Roi tractor-compressors raised job completions from one every two days, to four a day. Water shut-off lasts only a few hours — not all day or all night. Fire hazards are greatly reduced, and interruptions of street traffic are minimized.

Tractair can help you improve water service and cut labor costs. The attachments can save you thousands of dollars by eliminating the need for costly one-purpose equipment. Look into it today.

On-the-job air power shortens hose lines and provides full power for tools. Different tools can be operated at the same time.

Back hoe attachment turns Tractair into a digger. At Mansfield, attachment replaces eight pick-and-shovel laborers.

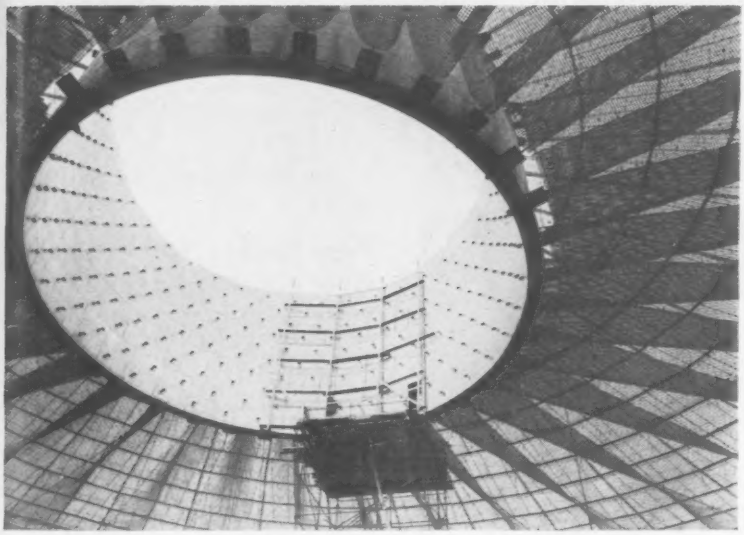
Backfill blade covers trench after break is repaired or tap is laid. Formerly, job was done with hired dozer and operator.

*"Tractair" is the registered trademark for Le Roi's combination tractor — air compressor.

WABCO

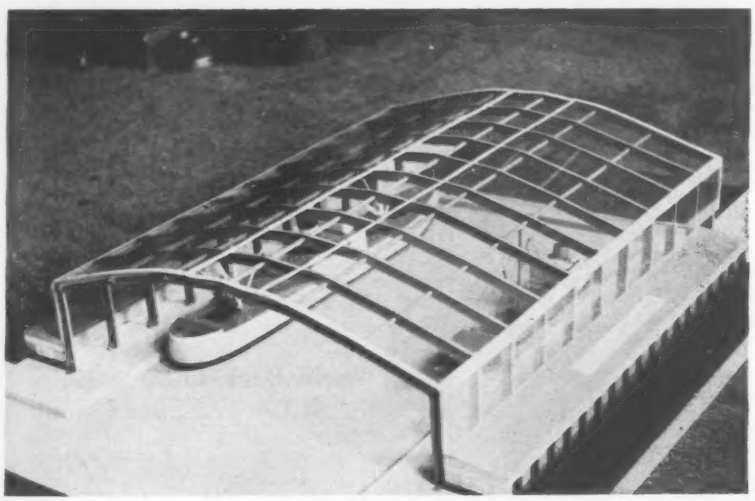
LE ROI Division of Westinghouse Air Brake Co., Milwaukee 1, Wisconsin, manufacturers of Newmatic air tools, portable and Tractair® compressors, stationary air compressors, and heavy-duty industrial engines. Write us for information on any of these products.

T-711



U.S. Big Wheel at the Brussels Fair

The center of the U. S. pavilion at the Brussels fair is a steel "hub" 66 ft in diameter and 29 ft high. It is suspended from, and serves as the central anchor for, cables that extend from the top and bottom rims to a steel ring truss around the perimeter of the 342 ft dia structure (ENR Sept. 26, 1957, p. 36). The ceiling of gold-anodized aluminum mesh is draped to produce a spoke-like effect. Above it, the upper cables support concentric rings of steel purlins, which carry a plastic roof.



New Zealand Port Eyes Ship Hangar

A huge glass-roofed shed that would shelter two ships at berth and permit all-weather cargo handling is under preliminary study at Bluff Harbor, New Zealand.

D. E. S. Mason, chief engineer of the Bluff Harbor Board, has proposed a ship hangar 345 ft wide and 75 ft high as a roof for berths 1 and 2, which will be 525 ft long, in the new port facilities now being built at Bluff Harbor, on the dominion's North Island (ENR March 20, p. 125). The board has instructed him to look into the idea

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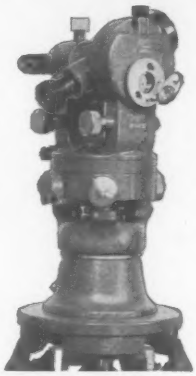

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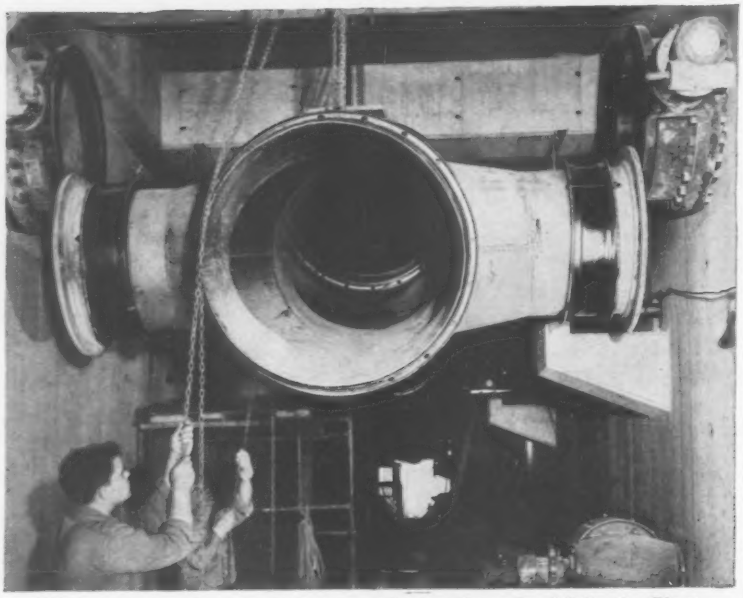
Easy does it

...the Dresser way



This is a cross on the main intake line at the new Clague Road Filtration Plant, Cleveland, Ohio. Designed by Havens and Emerson of Cleveland, the plant will have a normal flow of 50-million gpd. Hunkin-Conkey Construction Company is the contractor.

You don't need much leeway...the Dresser way

Not only was it the *easy* way, Dresser Couplings were actually the *only* practical way to install this steel cross on a filtration plant's main intake line. Note how little leeway exists between the valves and the pipe flanges. Bolting up would be impossible if the bolt holes were just a fraction out of line, but the Dresser method gives you the necessary "play". Settling concrete could change the valve centers, but the non-rigid Dresser Couplings will take deviation and remain bottle-tight . . . permanently. When you join pipe the easy way, it's the least expensive way . . . with Dresser Couplings.

With the flange bolted, the Dresser Coupling will close the gap and will absorb any expansion—contraction.

Bradford, Pennsylvania
Chicago
Houston
New York
Philadelphia
San Francisco
Toronto

DRESSER MANUFACTURING DIVISION

ONE OF THE DRESSER INDUSTRIES

further to determine whether it is feasible.

Two immediate unsolved problems, Mr. Mason says, are high masts and funnel gases. The first might be taken care of by greater roof height or telescoping masts. The ventilation difficulty might be removed by leaving a section unroofed along the middle of the shed.

Peru Starts 1,150 Ft Head Hydroelectric Power Plan

The Peruvian government has called for bids for the financing and construction of the first stage of the Machu Picchu hydroelectric power installation on the Urubamba River. Eventual capacity of the plant will be 120,000 kw. Cost of the first stage, providing for installation of a 20,000 kw unit and construction of a transmission line to Cuzco, is estimated at $7.2 million.

Main features of the Machu Picchu power project are: A diversion dam and intake on the Urubamba River; a tunnel 2.2 miles in length through a mountain-ridge, around which the Urubamba River makes a huge loop, to obtain a head of 1,150 ft; and the forebay, penstocks and underground powerhouse.

Commercial Nuclear Plant Will Be Built in Canada

The Canadian government's Atomic Energy of Canada, Ltd., will build a 200,000 kw nuclear power plant near Toronto by 1965 to produce power competitive with coal-fired stations. No cost estimates are available since the heavy water nuclear plant is still in the design stage.

The project is being undertaken in conjunction with the Ontario Hydro-Electric Power Commission and Canadian General Electric, who are working together in the development of the Chalk River nuclear power demonstrator plant of 20,000 kw capacity.

World Bank Loan to Help Egypt Deepen Suez Canal

Eugene Black, president of the World Bank, is scheduled to be in Cairo in April to discuss a loan to Egypt for a Suez Canal deepening project, it has been announced by the Suez Canal Authority.

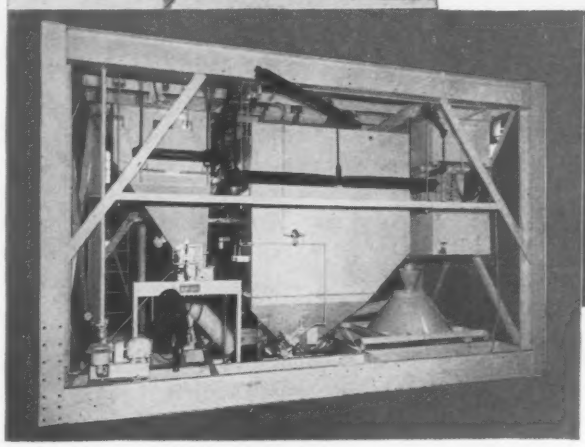
The anticipated loan will be used to widen and deepen the canal so ships of 37 ft draft can transit the waterway. At present only ships drawing up to 34 ft are authorized to use the canal.

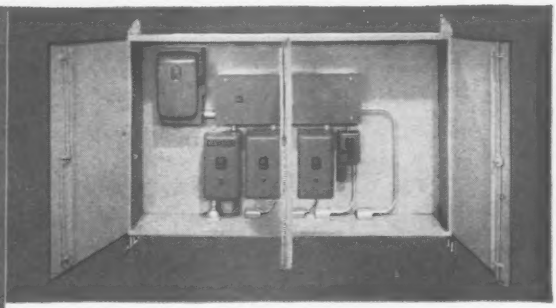
If an agreement is reached, Raymond A. Wheeler, former head of the U. S. Army Corps of Engineers, will super-

BUTLER Portability

COSTS YOU NOTHING!

Your BUTLER HP-85 Ready Mix Plant Pays Back the Cost of the Portability Features the First Time It's Erected





(Above) The Service Entry Panel provides all electrical connections.

(Left) The self-contained Butler HP-85 Batcher section has piping and wiring all in-place.

In the first place, the HP-85 is erected in hours instead of days. Bring it to your job-site today, you're pouring concrete tomorrow. And pouring is limited only by your crane and truck mixers.

Right there is an enormous saving in costly man and equipment hours.

Transport costs are low. All components are actually their own package. The bin is a unit complete with bracing. So is the batcher section, with air-piping and wiring all in place. Support columns are hinged to the batcher frame, swing into position as it is raised. The cement bin ships in one piece with legs attached and the two-piece elevator comes with buckets and chains installed.

But here's the biggest saving of all:

BUTLER provides a complete electrical Service Entrance Panel. All circuitry is installed, all switches in place — everything ready to plug-in with quick connectors. Field wiring is eliminated, at a saving of thousands of dollars.

That's it. While the HP-85 was engineered primarily to be moved from job to job, many Ready Mix operators are buying it for permanent installation. Why? It *more* than repays the cost of these features in one installation.

Want more details about the HP-85? Send for this Bulletin. Just write "HP-85" on a post card, sign it and send it in.

BUTLER BIN CO.

959 Blackstone Avenue • Waukesha, Wisconsin

vise the spending of the loan. His mission will be confined to supervision of financing, according to the Egyptians. General Wheeler was in charge of the Suez Canal clearance operation after the Anglo-French attack on Egypt in November, 1956.

The currently planned improvement is a modification of the old Suez Canal Co.'s eight and ninth improvement programs. The eighth program now is being executed by the nationalized Suez Canal Authority, but will be curtailed to make way for the so-called "Nasser Project". For this work, a new $2.8 million dredge, recently bought by the Authority from the Netherlands, went into service in February. The 3,600 ton dredger is 197 ft. long and has a 3,00[illegible] hp main turbine.

Tokyo Tests Monorail as Answer to Traffic Ills

A pilot monorail line was opened in Tokyo in December, to run 1,100 ft between Ueno Zoo and its aquatic garden. This monorail, Japan's first, will test the feasibility of monorails to solve Tokyo's traffic congestion.

Tokyo's Bureau of Transportation designed the overhead travelling tramway, supporting it from reversed J-type supporting pillars. The coach is 30 ft long, 7½ ft high, and 5½ ft wide and weighs 6 tons. Its weight has been kept down by using reinforced polyesthel material with glass wool and aluminum as materials for the chassis. And to hold down the noise, wheels have been soundproofed.

Brazil Dedicates Reactor

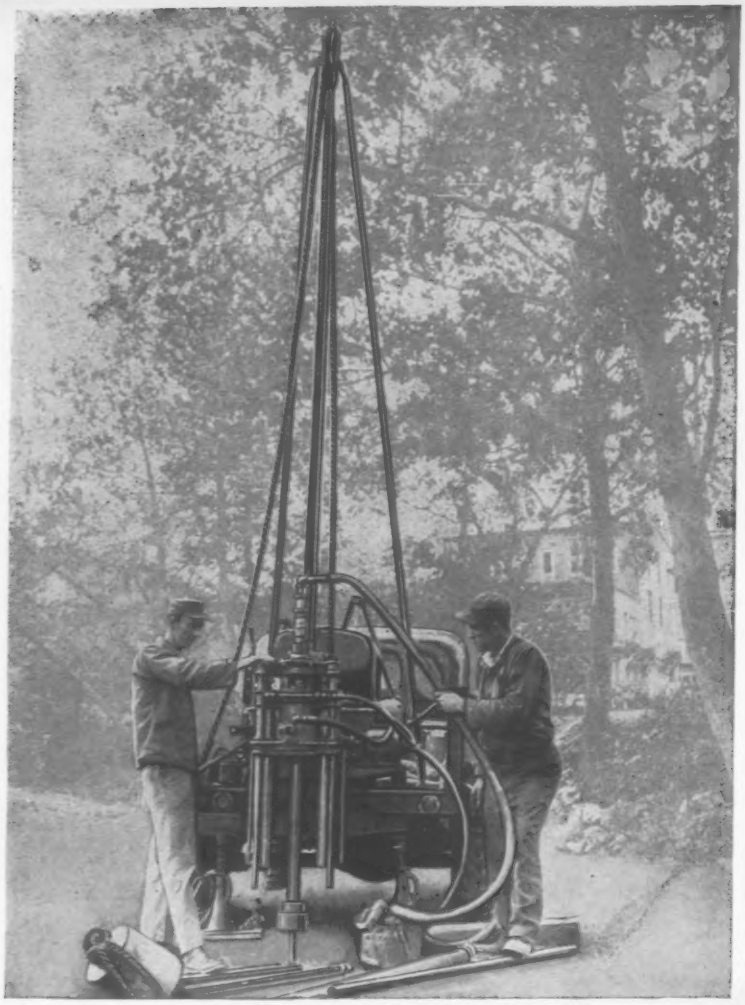
The Institute of (Brazilian) Nuclear Energy's research reactor—the first in Latin America—was formally dedicated on Jan. 25 in Sao Paulo.

Designed and built by Babcock & Wilcox, the reactor is capable of generating 5,000 thermal kw, making it five times more powerful than any other "swimming pool" type nuclear unit.

Located on the University of Sao Paulo campus, it will be used for training and research in nuclear engineering, reactor physics, materials testing, medical research and in other branches of biological and chemical research.

500,000 Kw Steam Plant Planned Near Hamburg

A 500,000 kw thermal power plant is planned for spring construction start near Hamburg on the River Elbe by Hamburger Electricitatswerke. Completion of the $55 million project is scheduled for 1965.



SPRAGUE & HENWOOD MAKES THE EQUIPMENT FOR THE SOIL SAMPLE OR ROCK CORE YOU WANT

With the earth-shaking increase in construction, you need efficient, versatile sampling and coring equipment.

Sprague & Henwood, Inc., a leading manufacturer of all types of equipment for foundation investigation, has just the right type for you!

Illustrated above, on location, is a truck-mounted Sprague & Henwood Model 30 Core Drill Machine. On this foundation project this machine is recovering both good samples and good cores. The soil samples have already been recovered from this boring and now the machine is being used to core rock. Because of the versatility and economy of this machine it is becoming a favorite of many contractors and other users throughout America.

The proper machine alone will not give you the good soil samples and rock cores you want. You need just the right samplers, accessory equipment and coring bits. If you need a sampler to determine only the general classification of the sub-surface soils or a sampler to secure samples for testing in a soils laboratory, Sprague & Henwood has it. There is a complete line of accessory equipment and the best in "Oriented" Diamond Bits awaiting you. One call . . . to SPRAGUE & HENWOOD, Inc., and your drilling equipment needs can be met.

SPRAGUE & HENWOOD, Inc.
SCRANTON 2, PA.

BRANCH OFFICES: NEW YORK • PHILADELPHIA • PITTSBURGH • ATLANTA
GRAND JUNCTION, COLORADO • BUCHANS, NEWFOUNDLAND
EXPORT REP.: PHILIPS EXPORT CO., 100 EAST 42ND ST., N. Y. 17, N. Y. CABLE ADDRESS: PHILYORK

CATERPILLAR

HELPS THE NATION KEEP ITS EYES ON THE ROAD

The highway program is picking up speed — and Caterpillar is making sure the public understands the importance of *your* work.

"The most important ingredient

Once a gravel pit bringing $3,320 in taxes, this land now yields $326,000 per year

PROSPERITY RIDES TO TOWN ON NEW HIGHWAYS

...and vital industries get a chance to disperse

Route 128, a new planned-access expressway which ares around Boston, was built to relieve traffic congestion. But it produced dramatic side results. It inspired industrial development, improved job opportunities, and unleashed new income for a suburban town. And it helped industry to disperse.

A former gravel pit in Needham, Mass., is typical. In 1952 the town received $3,320 in taxes from the land. Then Route 128 was built. The land became accessible . . . and valuable. Today the gravel pit is New England's first garden-type industrial center . . . an airy, spacious grouping of offices, warehouses and manufacturing facilities for 31 of the nation's leading companies. And Needham receives $325,000 in taxes.

The story is the same along the length of the new road. More than $100 million in new plants—not only in the center shown but in other growing developments, as well —now flank the broad highway.

Here's a hint of what's in store during the next few years. In that period the U. S. will build the greatest network of roads the world has ever seen. This will include 41,000 miles of expressways known as the National System of Interstate and Defense Highways, and the expansion and improvement of other state, county and urban highways.

These highways will permit you to travel farther . . . faster . . . and more safely than ever before. They will be broad avenues for the movement of goods and men in case of emergency. They will help industry to disperse, making it less vulnerable to attack. And because industry will follow the new highways, they will give you, and your community, great new opportunities.

* * *

GET THE FACTS—FREE! Which cities will be served by the Interstate-Defense System? When will it be completed? How will it benefit you? You'll find all the answers in the free booklets, "The Road Ahead" and "Your Stake in the Road Ahead." For your copies, write to Dept. 16P, Caterpillar Tractor Co., Peoria, Ill., U. S. A.

CATERPILLAR

REG. U.S. PAT. OFF.

Diesel Engines • Tractors • Motor Graders
Earthmoving Equipment

THE WORLD'S NO. 1
ROAD BUILDING EQUIPMENT

This full-page advertisement, one of a series, appeared in full color in April issues of *The Saturday Evening Post, Time, Newsweek* and *U. S. News & World Report.*

# of any public works program is the support of an informed public"

—"The Road Ahead"

The nation's enormous highway program—like any great undertaking—will have some obstacles to overcome. It is absolutely essential to your future as a road builder that the public never becomes so distracted by minor considerations that it loses sight of the program's main objective—to build a highway system adequate for the nation's defense needs and to meet the challenge of expanding economy and population.

This calls for pioneering work—on a grand scale. Like Caterpillar's extensive, nation-wide information program, which uses every modern technique to keep the public informed. Colorful national advertisements; hundreds of thousands of informative booklets distributed where they will do the most good; special motion pictures to be shown to important groups; a nation-wide speakers' program. All these are working together for you—to make sure the public never takes its eyes off the road.

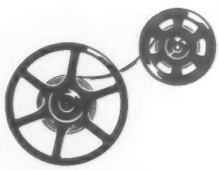
These publications and other items of public information are made available to you, our partners in road building, to help gain and keep the support of an informed public. If you wish samples, your Caterpillar Dealer can supply them—or simply mail in the coupon on the back page.

The spadework we do together on public opinion today will help make possible the earthwork we do together on the highway program tomorrow.

These Aids Are Available to Inform and Gain Public Support

"THE ROAD AHEAD" BOOKLET

The most complete booklet available explaining in lay terms every detail of the Federal Highway Program.



"THE ROAD AHEAD" MOTION PICTURE

Narrated by the well-known commentator, Walter Cronkite, this movie explains in detail every part of the highway program. Ideal for club and service group showings.

"YOUR STAKE IN THE ROAD AHEAD"

A booklet loaded with facts and figures that demonstrate graphically all the benefits of the highway program to the individual, the community, and the nation.

PREPARED SPEECHES

Covering every important phase of the highway program, these speeches are informative and interestingly written. They have been checked by the Bureau of Public Roads for accuracy.

18 miles of Interstate-Defense Highway
2 contractors—40 Cat machines

On this job E. M. Duesenberg, Inc., has two D9s, two D8s, three D7s, one D6, five DW21s, three No. 12 Motor Graders, one DW20, three D8-No. 463 Scraper units and three D6-No. 6S Bulldozers.

Caterpillar fleet in use by R. B. Burch, Inc., Cedar Rapids, consists of two D9s, D8 with No. 8 Ripper, two D8s with sheepsfoot tampers, eleven DW21s and a No. 12 Motor Grader.

More than 18 miles of U. S. Route 69 (Iowa's North-South Interstate-Defense Highway) are under contract. R. B. Burch, Inc., Cedar Rapids, has 17 big yellow machines at work on a 10.8-mile section; E. M. Duesenberg, Inc., Clear Lake, Iowa, has a 23-unit Caterpillar fleet on an 8-mile section.

Wherever you find the hard work, you will find Caterpillar machines . . . giving greater production, lowering operating costs and increasing profits. They have earned their position as the No. 1 road building equipment the only way it counts—by their performance on *every* type of earthmoving job in *every* corner of the globe. And by the Caterpillar research and development program which is continually finding ways to give still more efficiency . . . still more production . . . still more dependability.

It is natural that with the greatest job of all under way, road builders are turning again to the machines that have proved they are engineered for the tough jobs.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

ONE GOAL: To concentrate our capabilities, resources and experience on the design, manufacture, distribution and service of job-tested heavy equipment.

THE LATEST, MOST COMPLETE INFORMATION ON THE NEW HIGHWAY PROGRAM—FREE

Dept. ENR-4, Caterpillar Tractor Co., Peoria, Illinois

I am interested in the following information on the Federal Highway Program:

☐ "The Road Ahead" booklet. No. of copies____

☐ "Your Stake in the Road Ahead" booklet. No. of copies____

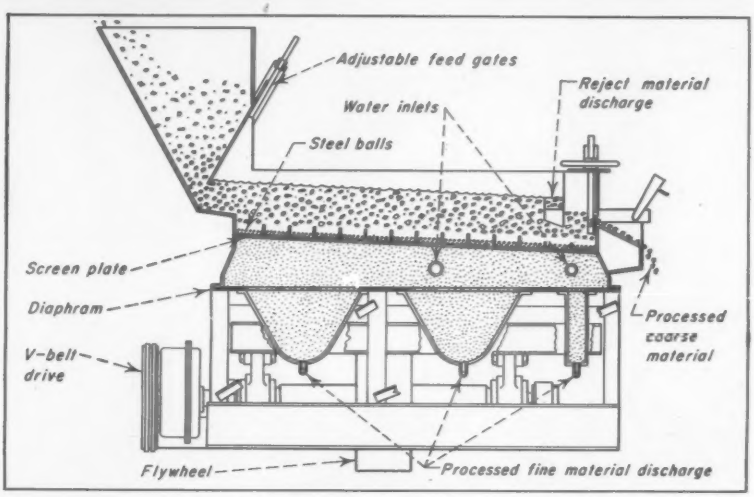
Name____

Company____

Address____

City____ Zone____ State____

These booklets are also available through your Caterpillar Dealer. He can show you the movie, "The Road Ahead" (23 min.). Call him.



MACHINE for cleaning and separating sand and gravel operates by pulsating water up and down through a bed of the material. Clean gravel is being discharged at left. Sand comes out below as indicated on the drawing.

Better Sand and Gravel by "Jigging"

Removal of deleterious materials from sand and gravel deposits has become more important as good natural deposits have become scarcer. Based on experience in the coal and iron ore industries, sand and gravel producers are therefore turning to beneficiation processes, which separate good from bad material, usually by virtue of their differences in specific gravity. A relatively new piece of equipment, which operates on this principle, is the Meckum Sand and Gravel Jig. The first experimental installation was made in 1952. Since then 27 installations have been made. The latest model is now in actual production.

Jigging classifies materials according to their specific gravities by flowing water alternately upward and downward through them. This creates a pulsating or jigging action causing the good, heavier materials to work downward and the lighter deleterious materials to rise to the top.

According to J. W. Meckenstock, president of Meckum, in a paper delivered before the recent annual meeting of the American Institute of Mining Engineers, the Meckum Jig is of the diaphragm type. Material enters a feed hopper at one end from which it is automatically and uniformly fed onto the jig bed, which is slanted downward to the discharge end. At the discharge end, a skimmer bar or trough carries off the reject material from the top while the good material, in the coarser sizes, passes underneath the skimmer trough and out. Sand passes through the jig bed, which is supported by a punched plate surface having channel troughs placed at right angles to the bed material flow, and filled with steel balls. Water is brought underneath the jig bed through valve controlled openings. A rubber diaphragm beneath the water inlets, which is actuated by an eccentric shaft, pulsates the water upward and downward through the sand and gravel jig bed.

The eccentric shaft and the eccentrics are journaled in roller bearings, and driven through a shaft-mounted speed reducer and a V-belt drive to a motor. The rate of pulsations varies with the work to be done. A power equalizing flywheel is located on the main shaft of the jig.

The jig is equipped with a drain board at the discharge lip, which drains enough water from the good gravel to permit it to be carried on a conveyor belt.

The sand material must be dewatered by some dewatering device.

Originally, it was thought that good jigging required that the particle size range be held in close limits, but jigs are now working successfully on material which is minus 1½" to 0" in size. Generally, the percentage of deleterious material to be removed from a sand and gravel deposit runs from 3 to 8%, and the jig usually removes above 90% of this material.

According to Mr. Meckenstock the cost of jigging is not over five cents per ton of sand and gravel treated, including all production costs such as labor, power, repairs, depreciation and overhead. MECKUM ENGINEERING, INC., OTTOWA, IOWA.

New 22 Ton Fork Lift Works With Delicate Touch

Powerful steel fingers that can lift 22 ton loads gently is the claim of the manufacturers of a giant fork-lift machine now on the market.

Many types of materials normally handled in unpaved areas—ranging from steel products to precast concrete structures—are said to offer work opportunities for this fork-lift. Depending on the materials to be handled, the lift can be furnished with fork, crane, ram, fork and tusks, or fork and jointed tusks.

The machine is similar to the standard LeTourneau Log Stacker, with the big difference being in the new Series FJ Stacker's having an electrically powered joint near the center of its tusks. This knucklelike arrangement makes possible the precise heavy load handling.

All electric power—from wheel drives to raising and lowering of the tusks—does away with the need for clutches, drive shafts and other mechanical drive mechanisms. R. G. LETOURNEAU, INC., 2399 S. MACARTHUR, LONGVIEW, TEX.

(*New Products continued on p. 102*)

Enlarger Makes Sharp Diazo Prints Rapidly

Sharp distortion-free enlargements of microfilm negatives can be obtained on diazo paper with a new projector.

The diazo enlarger, produced under the trade name of Helios Enlarger is a horizontal projector with a vacuum type easel supported on twin rails. The easel slides back and forward to make changes in scale. A helical lens mount provides for changes in focus.

The fixed head contains an air-cooled mercury vapor light for maximum light transmisison through the negative. A special grade diazo paper yields faster results although standard grades have preformed satisfactorily. No darkroom is required and standard developing is used.

Production models for 8½ x 11 in. enlargements will be marketed in the spring, with larger units to be available at a later date. KEUFFEL & ESSER CO., 260 MADISON AVE., NEW YORK 16, N. Y.

Adaptable Forms for Prestressed Concrete

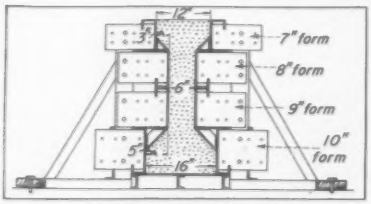
Steel forms for prestressed concrete can now be adapted to produce a wide range of shapes and sizes.

Side forms are made up of a series of panels that can be varied in several ways. They can be rearranged in sequence from top to bottom. They can be shifted horizontally, and when needed, over-all height can be adjusted with addition of fillers.

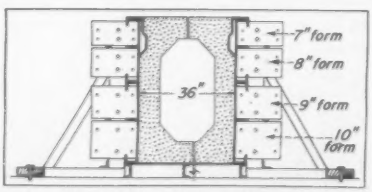
The side panels are held in position on a separate frame by adjustable plates on either side of the form. A series of holes punched in these plates and the frame permit lateral or vertical adjustment.

The manufacturer has designed a four-panel form with 7, 8, 9 and 10 in. panels. With this one form adjustments can be made to produce a variety of sections, including I-beams and hollow-box girders. With a series of panels of 7, 8, 9 and 11 in. height it is possible to make all of the approved AASHO and PCI bridge beams.

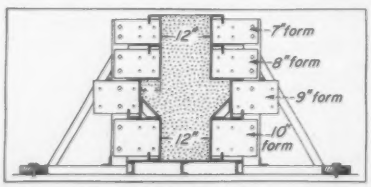
The forms are normally furnished in 10 ft long panels and can be manufactured in various heights. To produce the various slopes necessary to form haunched beams or I-beams, special bevel panels are furnished. The forms are stripped by removing one or both sides. BLAW-KNOX CO., 300 SIXTH AVE., PITTSBURGH 22, PA.



L beam girder



Box girder, slab, or channel



Specials

Dumpcrete Spreader Meets High Production Needs

A concrete paving spreader, designed to work with the Maxon Dumpcrete Body, has been introduced to meet the need for a higher production rate.

Speed, economy, quality and labor-saving benefits of the complete Dumpcrete method are features stressed by the manufacturer.

The spreader can take a 4½ cu yd load of concrete from the body, spread a 20 to 26 ft wide slab, strike-off and be ready for the next load in less than 90 seconds, say the manufacturers. MANUFACTURING DIV., MAXON CONSTRUCTION CO., INC., 2600 FAR HILLS AVE., DAYTON 19, OHIO.

Operator Visibility Is Key in New Tractor-Shovel

A 2½ cu yd tractor-shovel known as the Model 200 has been designed and built for extra heavy duty work with maximum speed and working efficiency, according to the manufacturer.

Features include underslung arms to provide more operator visibility and increased safety; 40 deg bucket tipback at ground level with maximum dumping height of 9 ft 6 in.; forward reach of 5 ft 7 in. at 7 ft dumping height.

Weight of the gas model is 19,500 lb; diesel model, 20,100 lb. N. P. NELSON IRON WORKS, 850 BLOOMFIELD AVE., CLIFTON, N. J.

"Noiseless" Air Tools Are Portable and Blastless

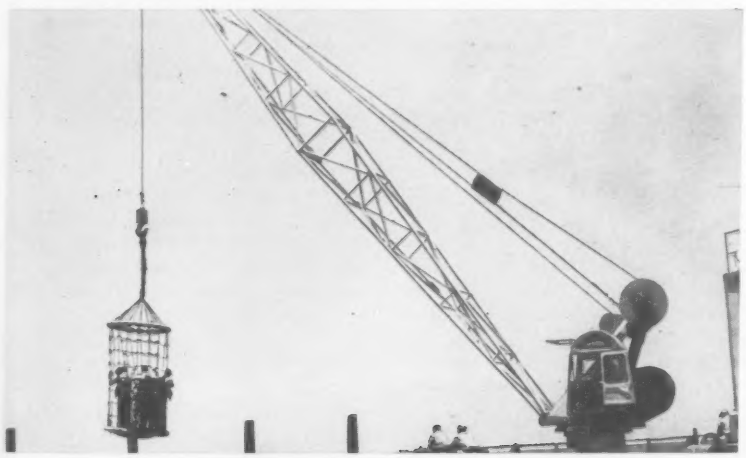
A new series of portable air tools are said to have noiseless, blastless exhaust. Initial models include light- and medium-duty drills, screwdrivers and tappers.

In the new tools, the exhaust air is routed back through a system roughly parallel to the inlet system and escapes near the air inlet. A porous bronze diffuser near the outlet deadens any remaining exhaust noise and dissipates the escaping air evenly. ARO EQUIPMENT CORP., BRYAN, OHIO.

One-Man Trencher for Close Work

A one-man operator trencher, the Arps Trench-Devil, Model Jr., is said to be ideal for gas or water line trenching, electric cable and telephone installations, lawn sprinkler systems and other light trenching jobs.

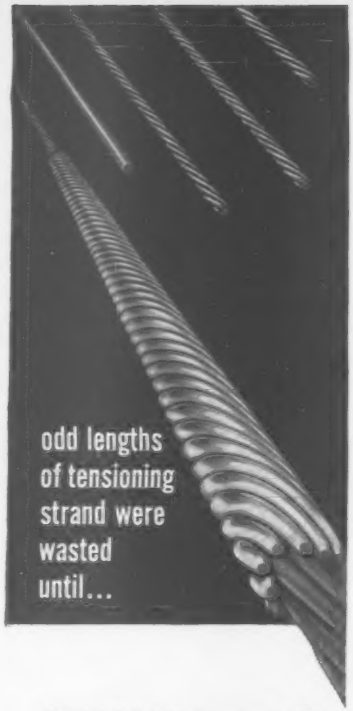
The manufacturer says that one man can transport the Trench-Devil to the job site, unload it from a truck, complete the work and relay the unit without assistance. The machine digs a trench 2¾ in. wide, up to 20 in. deep. At the 20 in. depth, this digging speed averages 6 ft per minute; a 12 in. depth increases digging speed to 15 ft a minute. ARPS CORP., NEW HOLSTEIN, WIS.



Electric Crane Has Powered Down-Travel

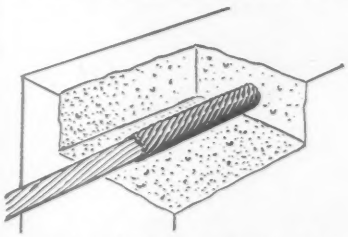
Previously available only as original equipment aboard LeTourneau offshore platforms, an all-electric deck crane featuring positive load control for capacities up to 25 tons is now on the market.

A principal feature of the crane is powered down-travel, where lowering speed is automatically regulated by regenerative electric braking. A heavy duty electro-mechanical brake system



...PREFORMED provided a splice that's stronger than the strand itself!

Now, Preformed Splices are used for splicing the strand used in pre-stressing concrete. You can salvage odd lengths of strand or save the strand when a wire breaks. Preformed Splices hold the full-rated strength of the strand and are available in the same material as the strand.



Are Preformed Splices and Dead-Ends the answer to one of your problems? Let our research and development people help you find out. Write PREFORMED LINE PRODUCTS COMPANY, 5349 St. Clair Avenue, Cleveland 3, Ohio. Cable Address: Preformed-Cleveland.

You can look up to

Preformed

Made in accordance with or for use under U. S. Patent Nos. 2,609,653, 2,275,019 and 2,587,521. Other patents pending.

ONE OF A SERIES of advertisements to help the construction industry get better service from wire rope.

SHOVEL Chain, Electric, or Steam Crowd
1, 2, 3, Part or Twin Main Hoist Line

DIPPER LATCH LINE

6 x 36G PREformed Regular Lay Whyte Strand Fiber Core
8 x 19E PREformed Regular Lay Whyte Strand Fiber Core
7 x 19 PREformed Aircraft Cord sizes under ¼"

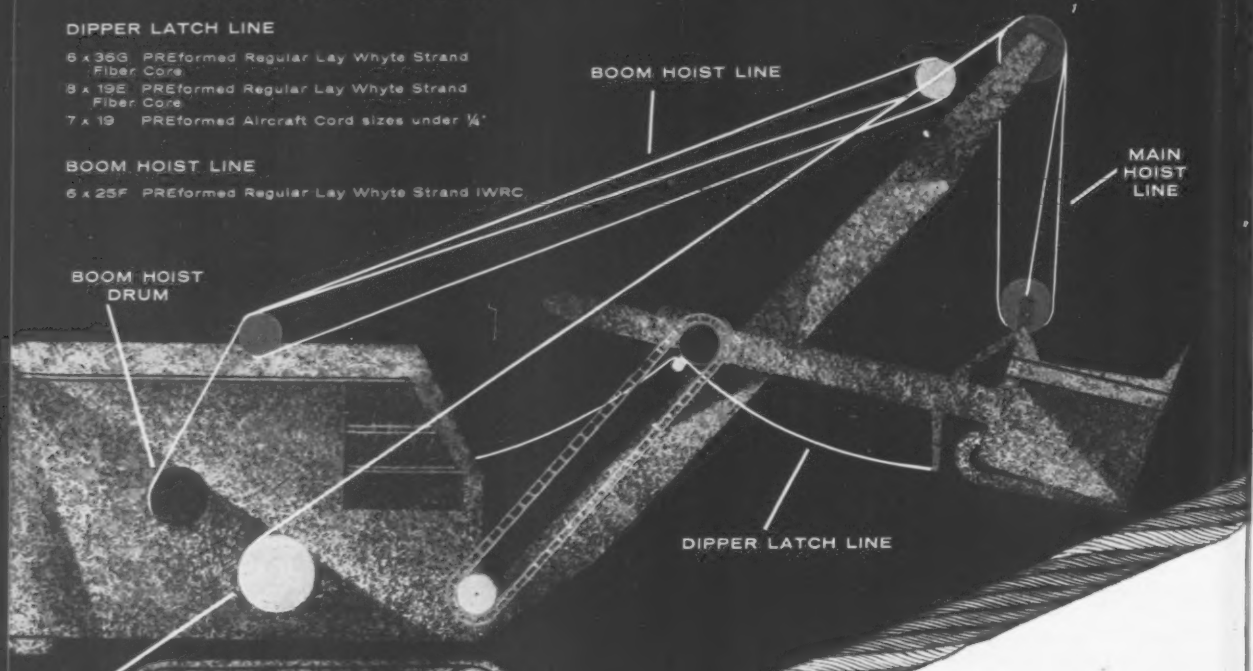
BOOM HOIST LINE

6 x 25F PREformed Regular Lay Whyte Strand IWRC

MAIN HOIST LINE

½" and ¾"	6 x 25F	PREformed Lang Lay Whyte Strand IWRC
	6 x 25F	PREformed Regular Lay Whyte Strand IWRC
⅞" and Larger	6 x 25F	PREformed Lang Lay Whyte Strand IWRC
1" and Larger	6 x 41F	PREformed Lang Lay Whyte Strand IWRC

*Where sheaves or drum diameters are less than 22 times rope diameter.



The correct Macwhyte wire rope will lower your yearly rope costs

You will make substantial savings in the amount of money you spend every year on wire rope for shovels — or any other equipment — if you use the right *type* of rope designed for your job.

Shown above are correct recommended wire ropes for use as main hoist line, dipper latch line, and boom hoist line on power-shovels. Each of the Macwhyte wire ropes listed is designed to shrug off the normal abuse, strain, and abrasion encountered in shovel service, and to offer exceptional service life.

Whyte Strand wire ropes are PREformed to eliminate any internal stresses in manufacture. This is particularly important in shovel service, where rough use and reverse bends subject *any* wire rope to severe flexing and bending strains as it curves around sheaves and drums.

In addition, every inch of Whyte Strand wire rope is internally lubricated. As the rope flexes, this enables adjoining wires to move by each other without wear, and extends the life of the rope. The tenacious lubricant also protects the exterior strands against moisture and corrosion.

Reeve up your shovels with Whyte Strand wire rope and watch rope costs drop! 103

MACWHYTE Wire Rope COMPANY

MACWHYTE WIRE ROPE COMPANY
2906 Fourteenth Avenue, Kenosha, Wisconsin

Manufacturers of Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal, Stainless Steel Wire Rope, and Wire Rope Assemblies. Special catalogs available.

MILL DEPOTS: New York 4, 35 Water St. • **Pittsburgh 36,** P. O. Box 10916, 353 Curry Hollow Road • **Detroit 3,** 75 Oakman Blvd. • **Chicago 6,** 228 S. Desplaines St. • **St. Paul 14,** 2356 Hampden Ave. • **Ft. Worth 1,** P. O. Box 605 **Portland 9,** 1603 N. W. 14th Ave. • **Seattle 4,** 87 Holgate St. • **San Francisco 7,** 188 King St. • **Los Angeles 21,** 2035 Sacramento St.

permits load positioning to within a fraction of an inch, says the manufacturer. This brake system is designed to fail safe—it sets mechanically and releases electrically, causing the load to remain static the instant the control switch is released.

Motors and gears all are located directly at work points, eliminating mechanical drives, torque converters and transmission system.

The company rates its cranes in "foot tons". The 300 ft-ton rating of the deck crane indicates it will lift 25 tons at a minimum boom radius of 12 ft, 6 tons at 50 ft, or any combination up to 300 ft-tons. The heavy duty boom lengths for the cranes vary up to 80 ft.

An ac motor is standard for the crane's swing drive; a dc motor, for more precise handling of heavy materials, is optional. R. G. LeTourneau, Inc., 2399 S. MacArthur, Longview, Tex.

All-Weather Water System Added to Concrete Mixer

An all-weather water system and added hopper refinements are among the new features of the 1958 Transcrete Truck Mixer.

A new design, longer-life water pump will give greater leakage protection and longer trouble-free operation, say the manufacturers. Also, relocation of the water controls will provide easier operation.

According to the company, the hopper has been redesigned to make it even more rugged than those of the past. Construction Machinery Co., Waterloo, Iowa.

Adhesive Offers New Method Of Wallboard Installation

A rubber-resin compound called Sheetrock Brand Adhesive, for application of wallboard to wood framing, adds to the growing use of adhesives in construction (ENR Dec. 12, 1957, p. 24).

A continuous bead of the adhesive is applied with a calking gun to the face of each wall stud and ceiling joist. The wallboard then is placed and nailed, 16 in. oc on walls and 12 in. oc on ceilings. As the board is nailed, the bead spreads across the frame member, giving a full bed approximately $\frac{1}{8}$ in. thick.

Miracle Adhesives Corp., Bellmore, N. Y., the developers, describe a number of advantages gained with the system: The mastic adhesive provides a cushion to help compensate for excessive lumber shrinkage, bridge minor framing irregularities, lessen nailing damage to the face paper and reduce nail popping. It is said also to require

MANITOWOC
SECTIONAL BARGES

- For floating all sizes of lift cranes, clams, draglines and other contractors' equipment.
- Easily assembled or knocked down for moving by rail or highway.
- Sections can be assembled into numerous barge sizes.
- Spuds, deck fittings, loading ramps and other accessories available.

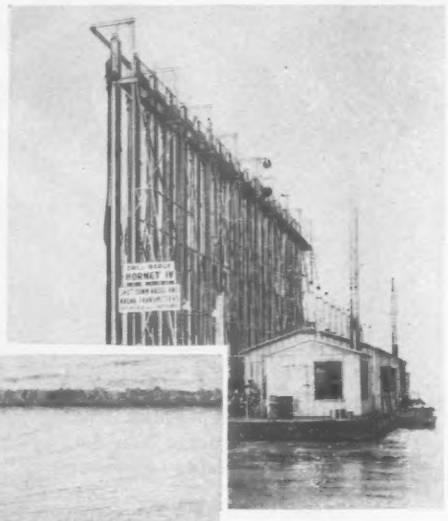


Photo to the right illustrates the drill barge HORNET IV used in the Amherstburg Channel deepening project by contractors Marine Operators of Windsor. This 20 drill rig including compressors and diesels is mounted on a 160' x 30' sectional barge made up of 11 sections. 40 foot spuds are used to position the barge.

A clam operation off the rock bound shore of Lake Superior. The crane is mounted on a 4 section barge which was transported by highway to the site.

PORTA-FLOATS

• THE FLOAT WITH A 1000 USES •

The Manitowoc Porta-Float is the smaller version of the sectional barge. The standard basic float is 32' x 8' x 4'. Units can be pinned together to make a wide variety of sizes and arrangements. Economical and versatile for floating all types of contractors' equipment. Ideal for floating docks, piers, etc. Porta-Floats are easily transported on trucks as illustrated below.

PORTA-FLOATS & SECTIONAL BARGES *MANUFACTURED BY*

MANITOWOC SHIPBUILDING INC.
MANITOWOC, WISCONSIN

Please write for additional information and prices.
Sold direct or through Manitowoc Engineering Corporation distributors.

This tough, rugged chain tape is justifiably called a "drag tape". It withstands the rigors of daily field use in all kinds of terrain. It outlasts most other tapes because . . .

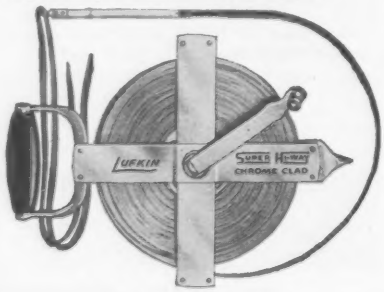
It Has Raised Markings and protective borders that are a part of the actual tape and will last as long as the tape itself.

The Line Is 5/16" Wide of special analysis steel that resists kinking and breaking.

It Is Chrome Clad®, an all-metal finish. The line is built up with a series of electroplatings, with a final hard satin-chrome finish that is resistant to abrasion, rust and corrosion.

It Is Easier To Read. The raised markings stand out sharply against the jet-black background; cannot be obliterated by mud and dirt.

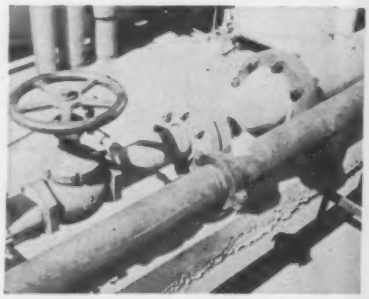
The SUPER HI-WAY Drag Tape is furnished in 100, 200 and 300 foot lengths, either with or without reels. Two leather end thongs and a chainman's conversion rule are supplied with each tape. Choice of three styles of end markings.



THE LUFKIN RULE COMPANY
TAPES • RULES • PRECISION TOOLS
SAGINAW, MICH. • MIDDLETOWN, N.Y. • BARRIE, ONT

50% less nailing, cutting and finishing during the taping operation.

Users say that the adhesive dampens the drum effect of impact sound, eliminates loose boards, is water and vermin resistant—and does not reduce the fire resistant qualities of gypsum wallboard construction. U. S. Gypsum Co., 300 S. Adam St., Chicago, Ill.



MARMAN CONOSEAL JOINT (arrow) requires only two bolts for assembly and lends itself to tight working quarters.

Pipe Joint Maintains Seal Under Adverse Conditions

A practical solution to the problems of connecting pipe or tubing of dissimilar metals subject to extreme temperatures and pressures may be the Marman Conoseal pipe and tube joint. According to the producer, the joint retains a perfect seal from −300F, to 1,800F, and rated capacity exceeds the burst pressure of the pipe used.

It is designed to maintain a leakproof seal under adverse conditions and lends itself to installations where working quarters are tight—requiring only two bolts to assemble.

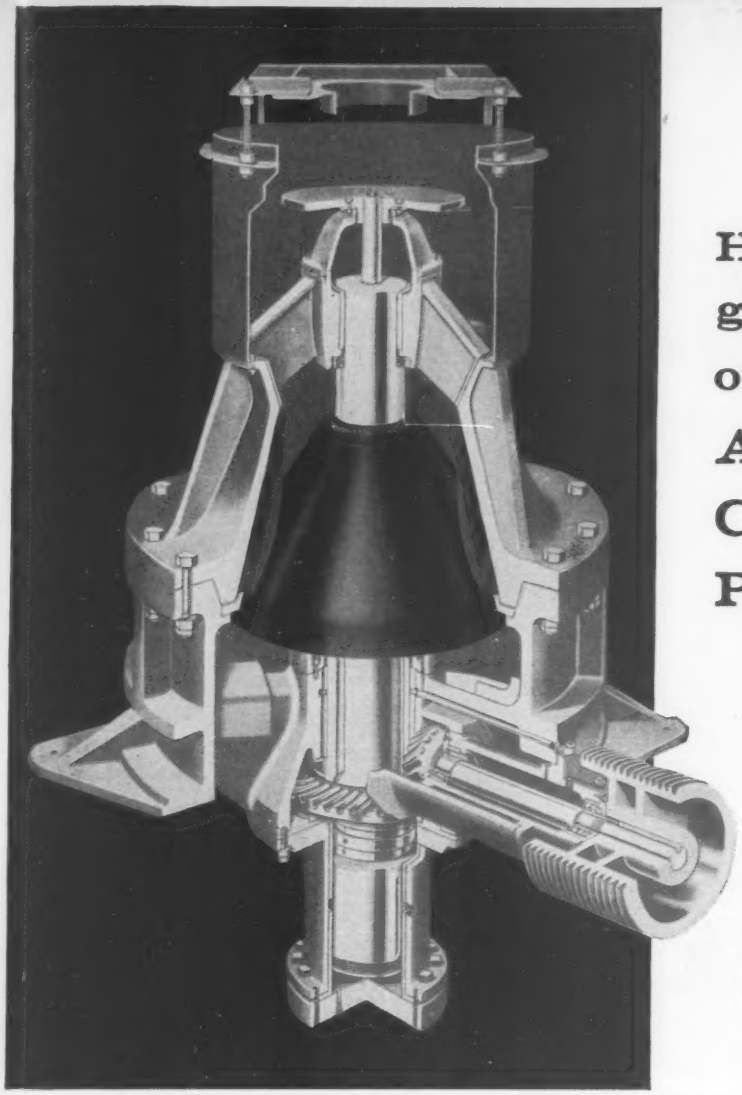
Made entirely of metal, the joint (arrow in photo) provides metal gasket compression with flexibility and sealing formerly obtained only through use of organic seals. The seal is maintained with axial defections up to 1/8 in. and slight parting of flanges under excessive or shock loads will not cause loss of pressure, it is said.

Standard sizes are available from stock, while special sizes are designed to order. Marman Div., Aeroquip Corp., 11214 Exposition Blvd., Los Angeles 64, Calif.

Lightweight Shovel Design Features Ease of Operation

A new tractor-shovel design features a boxed-section construction to permit easier installation and simpler operation.

The loader operates with 2½ in. bore double-acting lift and bucket cylinders with 1½ in. chromed rods and a lower



How a little give adds a lot of life to... AMSCO CRUSHER PARTS

Concave ring and mantle of this *Hydrocone* crusher are made of the toughest steel known . . . Amsco Manganese Steel. It *gives* a little, to take more punishment. *Hydrocone* is a registered trade-mark of the Allis-Chalmers Manufacturing Company.

Both mantle and concave ring crush a lot more feed because of certain properties of Amsco® Manganese Steel. The metal *gives* a little under crushing forces, absorbs stresses, resists cracking and chipping. Yet these same forces work-harden the surface of Amsco Manganese Steel to as much as 500 Brinell . . . a high hardness, stubborn to wear.

Amsco Manganese Steel Crusher Parts maintain their ductile undersurface and work-hardened surface even when worn thin. That's why Amsco parts endure severe abuse for so many work hours without letup.

To be sure of getting Amsco Manganese Steel, order replacement parts from your crusher manufacturer. Amsco makes manganese steel parts for most manufacturers of crushing, grinding and pulverizing equipment.

Amsco also produces other alloy steels with maximum wear resistance under particular service conditions

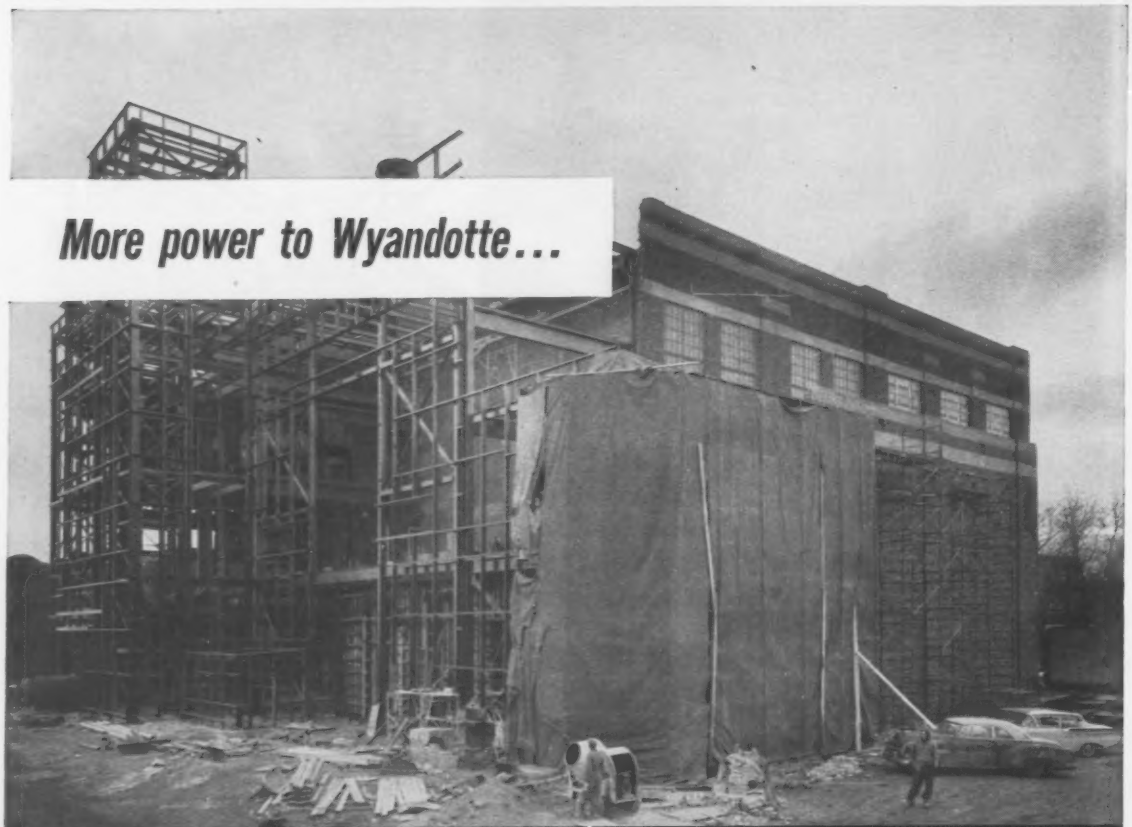
AMERICAN Brake Shoe COMPANY

AMSCO

American Manganese Steel Division • Chicago Heights, Ill.

OTHER PLANTS IN: DENVER, LOS ANGELES, NEW CASTLE, DEL., OAKLAND, CAL., ST. LOUIS; JOLIETTE, QUEBEC

The Charlson Co. of Wyandotte, Michigan, is building this addition to the Wyandotte Municipal Power Plant in accordance with plans and specifications prepared by Emery, Marker and Campbell, Engineers. Public Works Superintendent Carl Bufe says output will be doubled to 50,000 KW.



More power to Wyandotte...

INA performance bond helps keep cost low

This is the second time in eight years this contractor has brought more power to Wyandotte. And both times he has provided a performance bond with INA as surety.

On bid after bid, contractors benefit from *extra values* by using INA performance bonds. INA independent agents are able to offer the advantage of minimum rates* to fully qualified contractors.

Prompt handling, tremendous resources and broad experience in bonding are other extra values which count heavily when decisions are made. Call your nearest INA agent before working up your next bid. He's as cost-conscious as you are.

*Sorry, not available in Louisiana and Texas

INSURANCE BY NORTH AMERICA INA

INDEMNITY INSURANCE COMPANY OF NORTH AMERICA

pressure of 1,250 psi. It provides up to 20 deg of bucket rollback, a 58 deg bucket dump, and a height of dump of 9 ft at 40 deg dump.

With a rated capacity of 1,500 lb and a breakaway capacity of 3,000 lm, the new L600 loader can dig four inches below depth with a reach up to three feet ahead of the unit at 40 deg dump. HENRY MANUFACTURING CO., P.O. BOX 521, TOPEKA, KAN.

. . . New Products Briefs

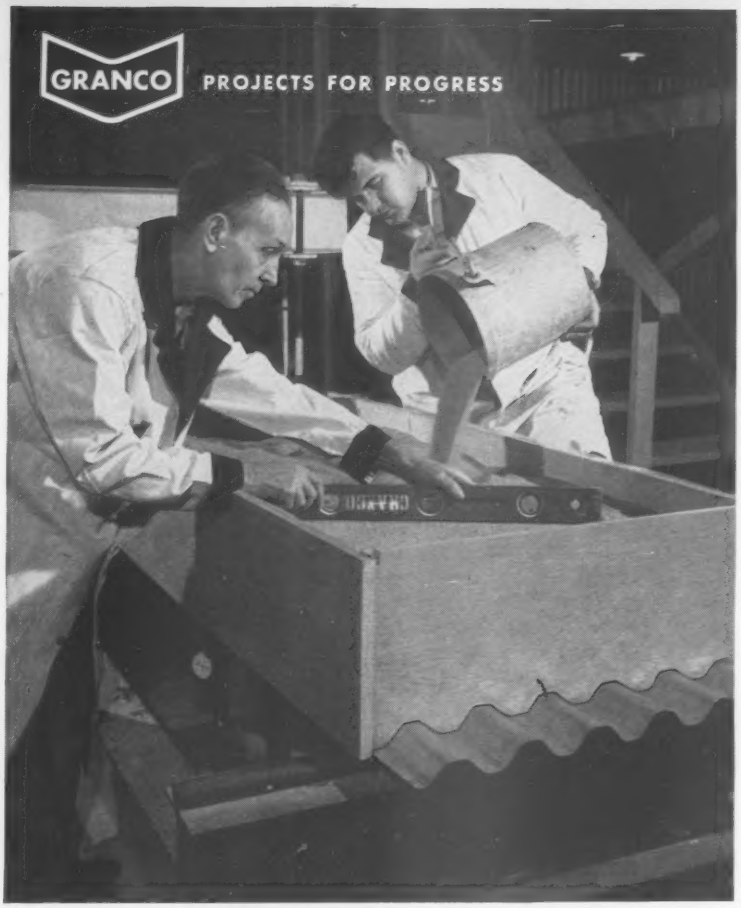
• **Roofing compound**—A new type cold-process asphalt roofing, reported to last twice as long as conventional roofing, while costing only one-half as much, is now on the market. The manufacturer claims that the product, known as Mightyplate, completely waterproofs a concrete roof without the use of paper, roofing felt or gravel, adheres to wet surfaces, and has better adhesive and aging qualities than conventional roofing. THE PANTHER CO., FORT WORTH, TEXAS.

• **Epoxy resin cement**—An aluminum-filled epoxy resin compound is being marketed in self-metering collapsible tubes to give additional convenience and economy in application. Metalset A4 can be used as a smoothing and calking compound, a repair cement and as an adhesive material for bonding metals, wood, concrete and glass. It is reported to be completely water and oil proof, resistant to acids and alkalis, and non-flammable. SMOOTH-ON MANUFACTURING CO., 572 COMMUNIPAW AVE., JERSEY CITY 4, N. J.

• **Roll-on roofing**—Cecoroll is a new type of corrugated steel roll-on roofing and siding for low-cost industrial buildings. Its flat crimped nailing edges make matching of corrugations unnecessary, and starting nails is easy, the manufacturer reports. Rolls come in 30 ft and 15 ft widths. CECO STEEL PRODUCTS CORP., 5601 W. 26 ST., CHICAGO 50, ILL.

• **Sealer**—"Panelseal," single-component calking sealant that permanently seals curtain-wall panels, eliminates the need for on-the-job mixing. It can be used directly as supplied, either in cartridges or in bulk packs, and is easily injected into horizontal or vertical seams. A pliable seal, unaffected by weather or other corrosive agents, is formed. THE BETTINGER CORP., WALTHAM, MASS.

• **Induction air conditioning**—New system of induction air conditioning which purports to represent substantial savings in initial costs, installation and operation, has been introduced. The system needs no changeover from chilled to hot water and uses smaller parts than conventional air-conditioning systems,



IN QUEST OF A TEST TO PROVE NEW PRODUCTS

Designers and builders must know how new products will perform before they use them. But how can you accurately predict product performance? Here's one way Granco does it:

Recently, Granco Steel Products Company redesigned its entire line of construction products by changing the corrugation pattern from a *rounded* to an *angular* shape.

Granco knew this change increased the strength of its products. Theoretical design figures proved it. But *finished* products don't always perform the way they do "on paper." Therefore, theoretical design figures aren't always useful in providing dependable data for product specifications.

Why not *test* finished products to find their actual strength? Granco research engineers did try various, commonly used strength tests *but* found that, under similar conditions, results often varied by as much as 15%! So Granco began looking for its own accurate test method.

Above, you see research personnel checking the strength of a Tufcor® steel sheet by loading it with dry sand. This sand load creates stresses within the sheet similar to those imposed by wet concrete. It's one example of the series of experiments Granco has made to determine most accurate test methods.

These tests enable Granco to furnish more exact design specifications for existing products and help pave the way for new Granco products, tomorrow.

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daylight to dollars?

There's more than meets the eye in a brass tacks approach to the problem of the best and most economical glazing medium you can use. Before you decide on any material for windows, skylights, partitions or other openings, remember that glass and glass alone gives you the proven performance you need for better daylighting at lowest cost. Write today for catalog 58-I, containing data on translucent, light diffusing glass. Address Dept. 20.

There is no Substitute for GLASS

- It is non-combustible . . . won't burn
- It is rigid . . . doesn't sag, warp or bend
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- It retains its original clarity and brilliance
- It is easily installed, maintained and cleaned by conventional methods.

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WORLD'S LARGEST MANUFACTURER OF ROLLED, FIGURED AND WIRED GLASS

the manufacturer says. It features a patented high-capacity double-coil room unit with higher secondary coil capacity than any other unit with a filter. Room units are available in a variety of sizes and styles. York Corp., York, Pa.

• **Siding**—Aluminum siding with attached insulation is being produced in nine baked enamel colors in 10 ft lengths. "Bak-R-Foam" is composed of an expanded polystyrene plastic foam that is bonded to aluminum. Tiny perforations on the bottom edge of the siding dissipate moisture. A tough film is bonded to the aluminum as protection against corrosion and acid-laden moisture. Alsco, Inc., Akron, Ohio, and Koppers, Co., Pittsburgh, Pa.

• **Ceiling design**—"Wakefield Ceiling '58" enables the contractor to lay out a variety of ceiling designs by combining standard components. He can choose from a selection of diffusers and louvers of varied style, pattern, material and size. Baffles and filters come in varied colors. An installer can erect the complete ceiling on the job with a simple crimp connector. The Wakefield Co., Vermillion, Ohio.

• **Aluminum windows**—Three series of aluminum windows for residential use are available. They come in double-hung style with channel frame sections; double-hung with integral fin-trim frame sections; and single-hung with integral fin-trim sections. Ceco Steel Products Corp., 5601 W. 26 St., Chicago 15, Ill.

• **Wallboard tape**—A Blister-proof, Wrinkle-proof and ripple-proof tape that is designed for Ames automatic tapers, has been put on the market. The manufacturer states that "Ta-Per-Tape" weighs about one-third that of conventional tapes and has about twice the tensile strength. The Marvan Corp., West Hartford, Conn.

• **Concrete flooring**—"Chemfast Concrete" is a floor material which, when applied as a topping over a Portland cement concrete base, is chemically resistant to most commercially or commonly processed chemical, claims the manufacturer. Truscon Laboratories, Detroit, Mich.

• **Plastic window**—Easy-to-install metal and plastic window that is claimed to require almost no maintenance has been developed. "Reso-Lite-Vents" have shatterproof panes, which pass almost as much light as clear glass. The Reso-Lite Corp. Zelienople, Pa.

• **Fire retardant tile**—Fire-retardant vinyl-asbestos tile is on the market. The tile, produced in 0.08 in. thickness in regular 9 by 9 in. size and in a variety of colors, is reported durable and easy to install and maintain. Kentile, Inc., Brooklyn, N. Y.

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about to zero in on

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See you in Booths 154 and 155

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Public Ledger Building, Independence Square
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Manufacturers of Mathews Hydrants and "Sand-Spun" Pipe (centrifugally cast in sand molds)

* We particularly want you to see our "babies" — scale model portable hydrants. We will have them on view at the Convention.

5 men can install a drainage structure like this in 2 days! A big 72" diameter USS AmBridge Sectional Plate Pipe 60′ long can be erected on the job and backfilled ready for use in *two days, with a five-man* crew using simple hoisting equipment and standard hand tools. *You just can't build 'em as fast with other materials.*

Another important advantage is that the structure can be used immediately after backfilling. Traffic interruptions are held to a minimum. In some instances, structures can be erected on the bank of a stream and lifted or rolled in.

No forms needed . . . no breakage! *USS AmBridge Sectional Plate Pipe, Pipe-Arches and Arches* eliminate the need for forms . . . and, being made of steel, there is no breakage. They are permanent . . . they can be extended whenever a fill or road is widened. Fabricated to meet all federal and state specifications, they are available in a complete range of standard sizes to satisfy the design requirements for any waterway opening.

FOR A FREE COPY of our 28-page AmBridge Sectional Plate catalog, write direct to our Pittsburgh office. For information on smaller drainage structures made from USS Galvanized Corrugated Culvert Sheets, please send your inquiry to United States Steel, Room 2801, 525 William Penn Place, Pittsburgh, Pa.

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General Offices: 525 William Penn Place, Pittsburgh, Pa. Contracting Offices in: Ambridge · Atlanta · Baltimore · Birmingham
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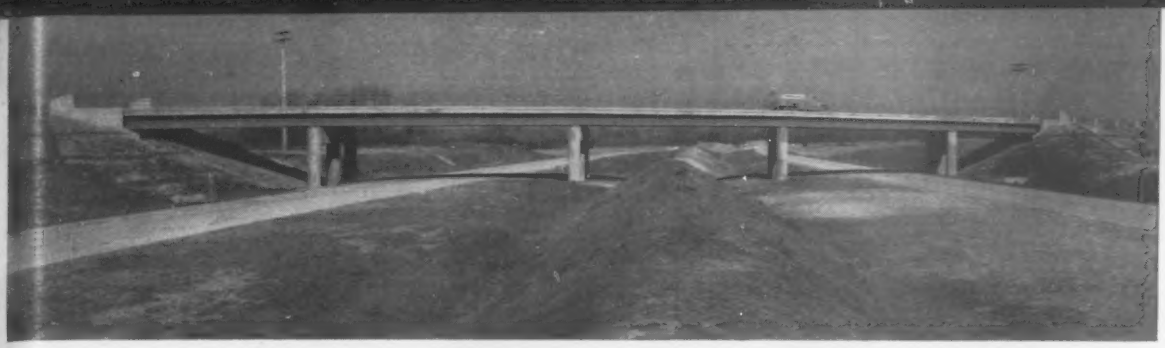
United States Steel Export Company, New York



Steel bridge erected in 7 working days! The 320′ long Evans Center-Eden Road Bridge on the New York Thruway contains 175 tons of *structural steel* fabricated and erected by American Bridge. Three of its five beam spans are 74′ 9⅛″ long. This is another example of the time- and money-saving advantages of building with steel. Steel also saves freight costs and storage space. Steel can be erected in *any* season. Steel can be accurately inspected at any time.

USS AmBridge I-Beam-Lok saves money on erection and maintenance. This lightweight, long-life flooring for modern traffic is available in units 6′ 2″ wide and up to 49′ long. With its full 5″ depth, it can be applied directly to stringers on spans up to 4′ centers to permit H-20 loadings. It does not require secondary supports. Ease and speed of installation minimize traffic interruptions. Shown here in open-type, it is also available in units ready to be filled with concrete. For detailed information, ask for free copy of 32-page catalog. Covers advantages, specifications and installation.

USS, AmBridge and I-Beam-Lok are registered trademarks

Bridge helps you for the money!

American Bridge
Division of USS **United States Steel**

Publications

Pipe systems—Specifications of ASA and ASME for welded pressure pipe and forged steel flanges are correlated and summarized in 48 page bulletin FB-77. It is intended as an aid in computing minimum safety requirements in pressure piping design. The extensive tabular matter makes possible a simple mathematical procedure in determining the requirements for minimum wall or maximum pressure, minimum pressure-stress ratios, maximum allowable working pressure, maximum allowable stress and nominal wall thickness. Published for engineers, the booklet should help eliminate some of the time consuming arithmetical procedures in computations of this nature. TUBULAR PRODUCTS DIV., THE BABCOCK & WILCOX CO., BEAVER FALLS, PA.

Concrete pressure pipe—A revised 16 page edition of the manual "Concrete Pressure Pipe Laying Instructions" has been published. Technical data is boiled down to practical application and on-the-job photos with brief explanations illustrating the step-by-step procedure of concrete pipelaying. Up-to-date tables of pipe sizes and deflection data are included. PRICE BROTHERS CO., 1932 E. MONUMENT AVE., DAYTON 1, OHIO.

Pumping stations—Prefabricated steel underground pumping stations are described in an eight-page bulletin. Engineers and contractors on subdivisions, industrial sites and other projects, where extensions to sewer systems require that the flow be raised to the level of existing mains, will be interested in these automatic operating stations that are available in capacities up 1,000 gpm. ZIMMER & FRANCESCON, P. O. BOX 358, MOLINE, ILL.

Buckets and grapples—Of particular interest to architects and design engineers of incinerator plants is Bulletin 2350-R-1, "Blaw-Knox Buckets and Grapples for Incinerator Service". The booklet provides information on the five sizes of two-line, lever-arm, clamshell-type buckets; standard two-line, lever arm, tine-type grapples; equalizer arrangements and incinerator buckets for single drum hoists. Bucket sizes range from 1 to 3 cu yd. BLAW-KNOX EQUIPMENT DIV., BOX 1198, PITTSBURGH 30, PA.

Automatic controls buyer's guide—A 64 page comprehensive guide is presented for the selection of controls for automatically controlling liquids in domestic, municipal or industrial applications. The guide features integrated, interwired electrical control systems for starting, stopping and alternating pumps, motors and compressors—either on-site or remotely for reservoirs, elevated tanks, sumps and tankless systems. The book is illustrated with more than 90 photographs and sketches. Functions of the units and where they can be used most advantageously are explained. AUTOMATIC CONTROL CO., ST. PAUL 4, MINN.

Venturi meter tubes—A comprehensive technical bulletin describing the various types of venturi tubes, their recovery characteristics, formulae that determine their design, typical calculations, and similar data is obtainable. It is illustrated with diagrammatic sketches, comparison charts and graphs, installation drawings, dimensional data, and capacity tables. Engineering Bulletin (110-P1). BUILDERS-PROVIDENCE, INC., 345 HARRIS AVE., PROVIDENCE 1, R. I.

Sewage disposal—A comprehensive 40 page booklet entitled "The Homebuilders Guide to Effective Sewage Disposal" is available. It covers a variety of typical situations encountered by builders in planning sewage facilities for both single homes and developments. Examples of various sewage pumping problems and their solutions, giving approximate costs per home in many cases, also are included. YEOMANS BROTHERS COMPANY, DEPT. S, 1999 NORTH RUBY ST., MELROSE PARK, ILL.

Flocculation—A 12 page bulletin outlines the flocculation process, illustrates the selection and application of flocculation equipment, and gives technical details of Rex Flocculators. Bulletin 315-51. CHAIN BELT CO., MILWAUKEE 1, WISC.

Photogrammetry film—A new motion picture, titled "The Map Makers" deals in detail with the application of photogrammetry. Tailored for showing to both technical people and laymen, The Map Makers is a 16 mm. color, sound-on-film movie, runs for approximately 13 min and tells the story of how maps are prepared. SPARTAN AIR SERVICES, LTD., 74 SPARKS ST., OTTAWA, ONT., CANADA.

Sand and Gravel Cleaning—Removing deleterious material from sand and gravel by the pulsating force of water, which floats these lighter materials to the top, is the job of the Meckum Sand and Gravel Jig, described in a new bulletin, No. 800. MECKUM ENGINEERING, INC., OTTOWA, IA.

Forms—A 56 page catalog describes the complete line of concrete forms, form ties, accessories, construction specialties and highway products. UNIVERSAL FORM CLAMP CO., 1238 NORTH KOSTNER, CHICARO 51, ILL.

Aluminum chart—A file-card-size chart, Sec. G, No. 1, covers aluminum government specifications and gives information on the bending and forming of aluminum sheet and plate. It shows chemical analysis requirements for federal and military specifications, as well as specified forms and the nearest corresponding ASTM, SAE and AMS specification numbers. The tables include minimum recommended bend radii for popular aluminum alloys and tempers; classification of alloys by temper according to relative formability; and typical values for elongation, shear, yield and ultimate tensile strengths. PETER A. FRASSE AND CO., INC., 17 GRAND ST., NEW YORK 13, N. Y.

Steel buildings—A revised booklet describes the manufacturer's steel buildings, and features the Steelox panel construction. Types include shed roof, gable roof frameless and gable-roof rigid frame. Accessories are detailed and the various types are illustrated. Booklet No. SX-13757. ARMCO DRAINAGE AND METAL PRODUCTS, INC., PRODUCT INFORMATION SERVICE, MIDDLETOWN, OHIO.

Pumps—Kenco's line of domestic and industrial submersible pumps with illustrated applications of their use are featured in a new catalog. Designed as a handbook for contractors and consultants, this eight-page catalog lists physical dimensions, pumping capacities, electrical data and specific features for each pump as well as detailed engineer's specification forms for specifying these pumps. KENCO PUMP DIV., 1309 OBERLIN AVE., LORAIN, OHIO.

Metal lath—"Metal Lath Specification Check List" lists each of the principal metal-lath assemblies and gives a breakdown of the components to be considered when writing specifications. METAL LATHE MANUFACTURERS ASSOCIATION ENGINEERS BUILDING, CLEVELAND 14, OHIO.

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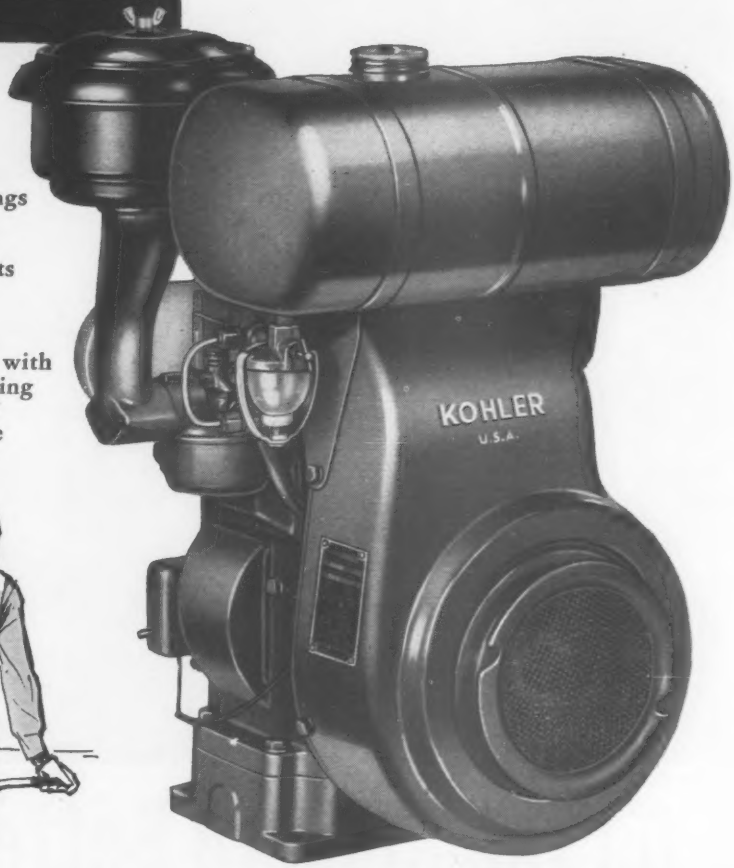

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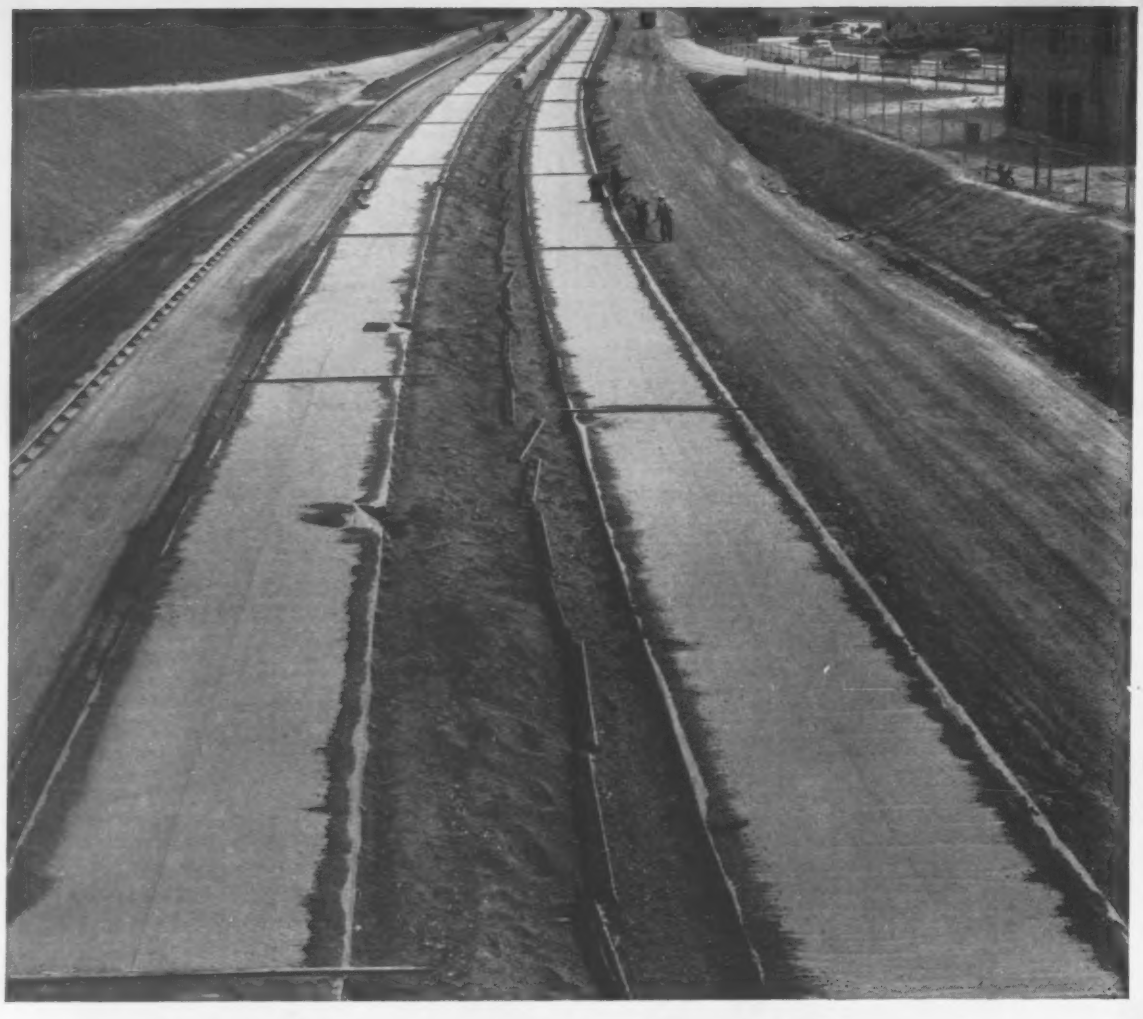

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Defects in House

Builder is not liable in absence of warranty

In the absence of an express warranty, a homebuilder who sells a completed house is not liable to the owner for latent defects.

A New Jersey court has noted that if the law were otherwise the real estate field would be pervaded by an element of uncertainty. The observation was made in a case that arose under the following circumstances.

In June, 1952, the plaintiffs purchased a newly constructed building from C. Young Construction Co., Inc., builder of the house. The house sewerage system was connected to the municipal sewer line by a pipe six and eight feet below ground level. This connecting sewer had been installed by the builder and seller of the house.

About a year after the purchase of the house, the buyers began to encounter difficulty from water backing into the cellar. Later, it was discovered that over six feet of the sewer was buckled and broken. The owner decided that to avoid further backing of sewage into the cellar, the best thing to do was to build a new connection between the house and the street sewer. This work cost the purchasers the sum of $649.99 and they brought an action against the seller to recover the amount. The purchasers were granted a judgment by the trial court, but this judgment was reversed on appeal.[1]

The appellate court stated: "A builder who sells a completed house is thereafter not liable to the purchaser for damages resulting from latent defects in the absence of express warranties in the deed or fraud or concealment. Neither fraud nor concealment is present here."

"As defendant (builder) notes, the policy reasons underlying the rule that the acceptance of a deed without covenants as to construction is the cut-off point so far as the vendor's liability is concerned, are rather obvious. Were plaintiffs (buyers) successful under the facts presented to us, an element of uncertainty would pervade the entire real estate field. Real estate transactions would become chaotic if vendors were subjected to liability after they had parted with ownership and control of the premises. They could never be certain as to the limits or termination of liability. The rule which we impose in the circumstances of the present action works no harshness on purchasers of real estate. Plaintiffs (buyers) had an opportunity to protect themselves by extracting warranties or guarantees from defendant (seller) in the contract of sale and by reserving them in the deed. This is not an uncommon practice, and when pursued allows both vendor and purchaser to know the nature and extent of their rights and liabilities and to order their affairs accordingly."

A party buying a new house from a builder should, for his own protection, provide in the contract that the seller will remedy any defects that may appear in the work within a specified time and that this contractual obligation shall survive the acceptance of the deed.

(1) Levy v. C. Young Construction Co., Inc., 134 A. 2d 717, Superior Sourt of New Jersey, Appellate Division, Sept. 20, 1957.

Public Works Bids

Court throws out bid that fails to conform

Ordinarily a bid must conform to the specifications to be valid. The degree of variation is the key to the validity of the bid in cases of nonconformity.

In the following Ohio case, the departure from the specifications was sufficient to render the bid void.

The City Counsel of Cleveland, Ohio, passed a resolution authorizing the Department of Public Works to award a contract for an incinerator to the lowest responsible bidder after competitive bidding.

The invitation for bids required that the bid be accompanied with appropriate data, sketches, sales specifications and other details of the equipment that the bidder contemplated using so that a true and thorough evaluation analysis of the bid could be made. The invitation to bidders also required the bidders to submit other details going to make up the bid.

The work was to be done at a gross price, but the bidders were allowed to base their bids on various types of equipment and the detailed information was required to properly evaluate the amount of the bid, since some types of equipment were considerably more expensive than others.

The low bidder was Hunkin-Conkey Construction Company. Even though this contractor did not furnish the detailed information requested in the invitation to bidders, the public authorities agreed to award it the contract, whereupon, National Engineering & Construction Co., as a taxpayer, made an application to the court for an injunction restraining the city from awarding the contract to Hunkin-Conkey Const. Co., which relief was granted by the court.[1]

Another ground on which the injunction was granted was that the amount of the bid was in excess of the amount appropriated for the work.

The court stated: "The Invitation to Bid and the Specifications presented a common basis for bidding, and the bids must be measured by that standard. There can be no question that the bid must conform to the specifications, and the contract to both. See Andrews v. City of Detroit, 233 Mich. 79, 206 N.W. 514. But not every variation from the specifications will destroy the competitive character of the bid. To have that effect the variation must be substantial. To be substantial it must affect the amount of the bid. It must give the bidder an advantage or benefit not allowed to other bidders. It must be an element considered in fixing the price. See Pascoe v. Barlum, 247 Mich. 343, 225 N.W. 506, 65 A.L.R. 833."

(1) National Engineering & Construction Co. v. City of Cleveland, 146 N.E. 2d 340, Court of Common Pleas of Ohio, August 12, 1957.

Subcontract Pledge

Promise to hire a sub does not constitute contract

The mere fact that a contractor, who contemplates bidding for a general contract, asks another contractor to submit a bid for part of the work does not constitute a contract.

Where, however, the general contractor agrees under such circumstances to subcontract part of the work to the sub if he gets the general contract, then there is a valid and enforceable agreement. If breached, the contractor becomes liable for damages.

The fact that the party for whom the work is to be done may object to the use of the subcontractor in question is no defense to an action for damages because of the breach[1].

In a New Jersey case,[2] a contractor who was contemplating submitting a bid for the prime contract requested another contractor to give him an estimate for performing part of the work with the understanding that if he was awarded the general contract, he would

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subcontract that particular part of the work to the other contractor.

The general contractor was the low bidder, but before the contract was awarded to him he was asked to list the proposed subcontractors. When this was done, the party for whom the work was being done stated that the subcontractor with whom the original agreement was made was unsatisfactory to him, since he had had difficulties with him on another job.

The general contractor made no effort to convince the owner that the proposed subcontractor was competent to perform the work, but agreed to and did subcontract the work to another subcontractor. The contractor who originally had submitted the estimate to do part of the work then brought an action to recover damages for breach of contract. At the trial it appeared that the difficulties the owner claimed he had previously encountered with the proposed subcontractor had not been encountered with him but with the general contractor for whom the subcontractor in question had done the work. The subcontractor was granted a recovery, the court holding that the refusal of the owner to accept the subcontractor, while it might have made obtaining the contract by the prime contractor impossible, was no defense to the action brough by the subcontractor to recover damages for breach of contract.

(1) ENR, July 11, p. 97-98 and cases there cited.

(2) Schaefer v. Brunswick Laundry, Inc., 116 N.J.L. 268, 183 A. 175.

Public Authorities Have Limited Contract Rights

Public authorities generally cannot enter into contracts except under the conditions authorized by statute. Failure to comply with the law makes a contract unenforceable.

An engineer recently encountered this stumbling block in Pennsylvania.

He had been hired by a municipal authority to do the engineering work for a water project, which had an estimated cost of $760,000. His fee was to be 6% of the cost. Later, the water works were sold to a county authority with the understanding it pay part of the engineering charges.

The engineer charged $34,200 for the work he did. The claim was rejected as excessive. A suit was brought against both authorities but was dismissed on the grounds that no enabling ordinances essential to the validity of the contract had been enacted as required by law.

In its ruling the court[1] said:

"In Harris v. City of Philadelphia, 283 Pa. 496, 129 A. 460, 462, it was stated: 'It has been uniformly held, and may now be regarded as the general rule in this state, that, where a statute provides a method or formal mode of making municipal contracts, such a provision is mandatory and must be observed, otherwise the contract is not enforceable against the municipality.' See, also, Luzerne Township v. Fayette County, 330 Pa. 247, 251, 252, 199 A. 327; Wilkes-Barre Connecting Railroad Co. v. Kingston Borough, 319 Pa. 471, 474, 181 A. 564; Stange v. City of Philadelphia, 308 Pa. 339, 162 A. 833."

Public Authorities have no power to contract except under conditions contained in local statutes.

(1) Burke v. North Huntingdon Township Authority, 136 A. 2d 310, Supreme Court of Pennsylvania, Nov. 18, 1957.

Oral Testimony Allowed To Show Contract Date

Even though a contract has been reduced to writing, oral testimony is permissible to show that the contract was not to become effective until the happening of some future event.

In discussing this issue, the Supreme Court of Arkansas said:

"Even in the case of a written contract duly executed by both parties, this court has repeatedly held that parol evidence is admissible to prove that it was not to be a complete and binding agreement until certain conditions precedent have been fulfilled. Barr Case & P. C. Co. v. Brooks-Ozan Mer. Co., 82 Ark. 219, 101 S.W. 408; American Sales Book Co. v. Whitaker, 100 Ark. 360, 366, 140 S.W. 132, 37 L.R.A., N.S., 91; Worthen v. Stewart, 116 Ark. 294, 172 S.W. 855; Reynolds v. Ashbranner, 212 Ark. 718, 207 S.W. 2d 304, 307. In the Reynolds case we said: 'The situation here is not that of a waiver of a condition precedent stated in the written contract; rather, it is the waiving of the condition precedent to the coming into existence of the contract. See, 17 C.J.S., Contracts, Section 338, on "Conditions Precedent", page 792. In 13 C.J. 791, in discussing the waiver of a condition precedent in actions concerning contracts, the general rule is stated: "The question as to whether a condition precedent has been performed is purely one of fact to be determined by the jury under evidence. And the same has been held to be true of the question as to whether the performance of such condition has been waived, but the

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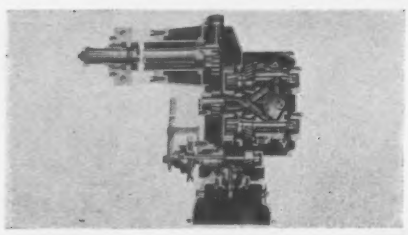

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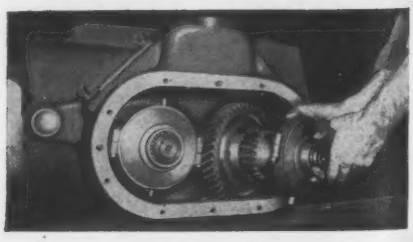

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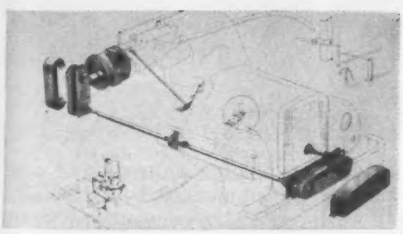

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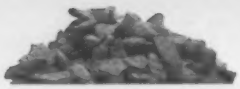
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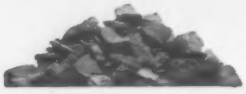
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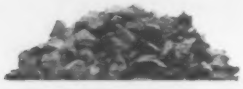
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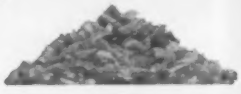
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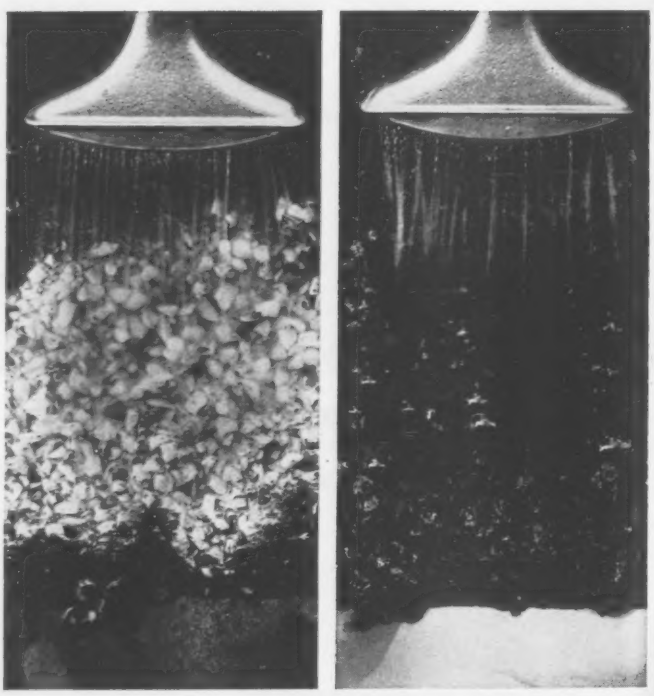

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jury should be properly instructed as to the law." See also, 17 C.J.S., Contracts, Section 630, page 1297.' "[1]

(1) Southern Wooden Box, Inc. v. Ozark Hardwood Mfg. Co., 294 S.W. 2d 761, Supreme Court of Arkansas, Nov. 5, 1956.

No Liability for Defects Due to Defective Plans

When a contractor has performed the work in accordance with the plans and specifications, he has performed his contract and is not responsible for defects that may appear in the work as a result of defective plans and specifications.

The owner of a new house brought an action against the plumber for improperly installing the heating equipment. The plumber also brought an action to recover the amount due him under the contract. Both cases were tried by a jury which found as a fact that the equipment that was installed by the plumber that proved defective was the equipment that the owner directed the plumber to install. Judgment was entered in favor of the plumber. This was affirmed on appeal.[1]

The appellate court stated: "Even if the heating specialist consulted by the owners made an error in judgment and the plumber followed the resulting instructions by or on behalf of the owners, he would not necessarily be responsible in damages if the plant did not work, or at least so a jury could find."

Objection was made to the testimony of a heating expert called by the plumber. As to this objection, the appellate court stated: "The witness was an engineer; had extensive training in heating and radiation, academically and by experience; and we think the court was justified in taking his opinion as to the adequacy of the plant as installed by the plumber. The mere fact he had never, as a contractor, installed a heating plant does not disqualify him."

(1) Delair v. Gaudet, 163 N.Y.S. 2d 685, N. Y. Supreme Court, Appellate Division, Third Department, June 13, 1957.

These summaries of court decisions are prepared by J. Vernon Werbin, Esq., New York attorney and licensed professional engineer, who is author of the following books published by McGraw-Hill Book Company, Inc.: *Legal Phases of Construction Contracts; Legal Guide for Contractors, Architects and Engineers;* and *Legal Cases for Contractors, Architects and Engineers.*

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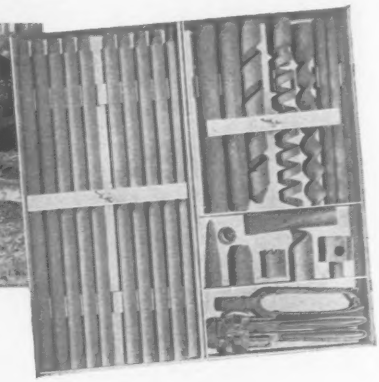

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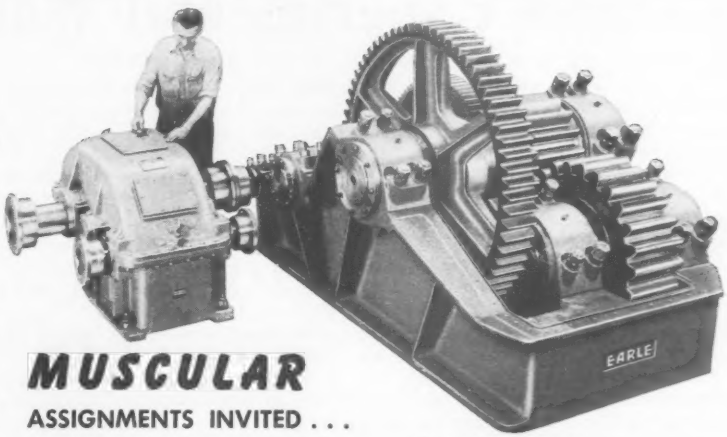

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Heading up the city's water department of 2,700 personnel under Water Commissioner James W. Jardine are three outstanding engineers (see cover): W. W. DeBarard, Deputy Commissioner for Water and Chief Water Engineer; H. H. Gerstein, Assistant Chief Water Engineer; and John R. Baylis, Engineer of Water Purification.

With their broad background of waterworks and sanitary engineering experience totaling 150 years, of which 80 years have been in the city's water department, they head up Chicago's great work in water purification research and outstanding progress on the administrative and distribution fronts.

• **Early research**—Chicago's research in water purification began in 1928 in an experimental filtration plant at 69th and Oglesby. Ten years of experience at that plant went into the design of the 320 mgd South District Filtration Plant on Lake Michigan.

Similarly, knowledge gained from both research and operations at the South District Plant during the past 12 years is reflected in the design of the giant 960 mgd Central District Filtration Plant—the world's largest—now under construction and scheduled for completion in 1961.

The old experimental plant was under the direction of John R. Baylis who had come to Chicago in 1926. The first research work there was devoted to removing objectionable odor and taste and led to the trial of activated carbon. Baylis wrote the first authoritative report on this process to show that it could be used on a large scale to remove odor from water. Today activated carbon is the most widely used means of removing odor.

One of the toughest research problems that Chicago ever whipped involved design of the filter beds for the South District plant. Experimental plant operation showed that in the winter months the coagulation preceding filtration was weak, requiring a fine filter sand. Contrarily, during the summer months the relatively good coagulation achieved precluded the use of fine sand for the filters.

Attacking the problem by trying to strengthen coagulation during the winter, Baylis and crew discovered that an activated silicate (sodium silicate treated with sulphuric acid) did the job. Consequently, a comparatively coarse sand was able to meet the requirements of both summer and winter operation, with an added benefit. The number of filter washes annually is about half that a finer sand would require.

• **High filtration rates** – Experiments conducted over the past 10 years with the South District plant filters have proved that Lake Michigan water at Chicago can be filtered at a rate of 5 gpm per sq ft of filter surface with no impairment of bacteriological quality. In fact, the filter performance is better for the high rate filters than for those operated at the very common 2 gpm

rate. This work, which was under the direction of Mr. Baylis who had moved over to run the South District Plant, is the backbone of the current trend by water engineers all over the country to design for higher and higher filter loadings. It is also the basis for the hydraulic design capacity of 3.5 gpm for the Central District plant.

• **Chemicals handling**—One of the biggest research activities at the South District plant concerns handling of chemicals. When the plant was designed, handling most of the chemicals in a dry state was considered the best procedure. However, Chicago soon found that the cost of keeping dry-handling machinery running was quite high. Conversion to using such chemicals as alum and ferrous sulphate in liquid form and activated carbon in a slurry followed.

The Chicago pioneers didn't have much to go on in handling liquid activated carbon. Consequently, experimental equipment was installed, operated and perfected over several years before the full-scale conversion was made. Today the system works extremely well, with a $6 per ton saving in purchase of the chemical and considerable additional saving in handling it. The method employs hopper-dump railroad cars dumping into slurry tanks equipped with agitators, where the activated carbon is mixed with water and pumped to feeding tanks in the chemical building.

Recommendations that liquid aluminum sulphate and ferrous sulphate be tried came from the manufacturers of that chemical. These also have proved eminently successful.

Research of a localized type licked a pressing distribution pipe corrosion problem in Chicago. An extremely extensive trial and error procedure yielded the proper pH value of water which would prevent corrosion in the mains and still not clog hot water heaters in homes. Currently a pH value of 7.9 is being used, although additional experiments being conducted may result in a slight reduction of this figure.

• **Electron microscope**—One of the most important research instruments at South District is a $20,000 electron microscope used to detect coliform bacteria. In use for about eight years, its chief value is the speed with which bacteria in the water can be identified, especially when a water main breaks or it is necessary to cut into the 4,000 mile water distribution system that serves Chicago.

RADIOACTIVITY COUNTER and recorder is examined by W. W. DeBarard.

Under normal conditions it would take about 96 hours to sample the water and test for B-coli. With the microscope the time has been shortened to 20 hours. This is good public relations, says Commissioner DeBarard.

Another major research operation is the continuous monitoring for radioactivity with geiger counters, of both the raw and treated water from the plant. This operation, which has been going on for the past eight years, was instigated at the suggestion of Chicago University scientists during the early development stages of nuclear fission materials.

• **Filter bed research**—Chicago's big three in water see the need for additional research in sand filter bed design to cope with the gradual disturbance of the sand and gravel due to backwashing.

Two separate studies on the performance of filter materials have been conducted for the past two years. One uses a glass enclosed (for observation) filter 3x3 ft in plan. The other uses a clear wall plastic pipe of 6 in. dia. Indications are that filter materials should be of higher specific gravity than those used originally, around 3.0 compared to 2.55.

There is much current practical research under way at South District. One of the nation's first magnetic flow meters, a 20 in. size, is being tested (and successfully) on a filter effluent line in advance of a venturi meter. An experimental method of removing sand and fine gravel from filters with a sand pump has shown itself to be satisfactory. And removal of every other flight in the scraper (for 20 ft spacing) in one of the plant's sedimentation tanks has shown no impairment of sediment collecting capacity.

• **Men who run it**—The most striking aspect of the three men behind Chicago's pace-setting water treatment research program—and a number of notable accomplishments outside the plant—is their truly youthful outlook after 150 years of combined work in and around the water engineering field. Chief Engineer DeBarard has been a waterworks man since 1896; John R. Baylis has been at it since 1905; while he is the youngster of the trio, Hy Gerstein has been in the business since 1925.

Armed with a chemistry degree from Beloit College in 1896 and a 1901 sanitary engineering degree from MIT, W. W. DeBarard has been associated with the great names of the waterworks field all during the knockabout years of his career building and operating water plants through 1910, a 31 year stint as western editor of ENGINEERING NEWS-RECORD (it was ENGINEERING RECORD when he started), 11 years as city engineer of Chicago after compulsory retirement from ENR in 1941 and currently 6 years in his present title which was a result of an administrative reorganization in Chicago in 1952. Around the turn of the century he worked with and for men such as Evastus G. Smith, Morris K. Knowles, Charles Gilman Hyde, John H. Gregory, and Landon Pearse.

He classes John R. Freeman as America's greatest waterworks hydraulician and if pressed would probably name John Baylis as the country's foremost water treatment engineer.

One of Mr. DeBarard's great personal triumphs was in bulldozing through to completion during and after World War II the South District Filtration Plant—then and now the world's largest. A steadily deteriorating raw water quality near the Lake Michigan intake serving the south side of the city convinced him that war or no war, the $27 million plant must be constructed.

He speaks enthusiastically of the underground distribution leak detection program he instigated in Chicago. Its result: Average pumpage last year was the same as it was 25 years ago, despite an increase of 800,000 in population (total served 4.5 million) and skyrocketing air conditioning and industrial use of water in the interim.

The 83-year-old water chief still keeps in close touch by almost daily inspection tours of the city's pump station and filtration plant. Saturday mornings, he and the Messrs. Gerstein and Baylis get together in what they call "brain-storming" conferences on Chicago's water problems—from which

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Digging and hauling are reduced to one continuous operation by using either a Sauerman DragScraper or Slackline Cableway. By combining the two basic steps of material flow, equipment and labor costs are halved—or even more. A single machine, controlled by one man, does the same job as the multiple equipment required by other methods.

Profitable handling is further assured by a low maintenance cost of 1½ cents per cu. yd. for an average size installation. Larger machines drop this cost still lower. Important, too, is the money saved on power. You pay only the cost of moving the actual digging tool—the Crescent DragScraper or Slackline bucket. Heavy machines with limited handling-to-dead weight capacity are eliminated.

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Sauerman DragScrapers range in size from ⅓ to 15 yds. They can be worked over spans of 1000 ft.

Crescent approaches hopper in front of tubular mast. Inset shows operator at hoist controls.

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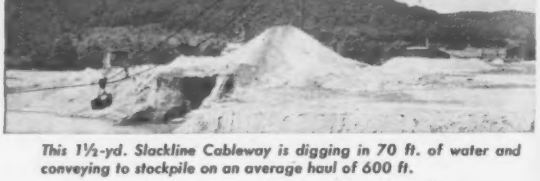

This 1½-yd. Slackline Cableway is digging in 70 ft. of water and conveying to stockpile on an average haul of 600 ft.

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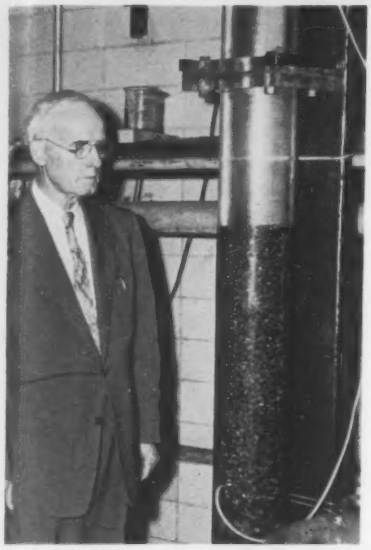
. . . Chicago trio pushes waterworks research



EXPERIMENTAL FILTER BED for backwash work is noted by J. R. Baylis.

many of the research and plant improvement projects have sprung.

Mr. DeBarard's engineering honors include honorary membership in the American Water Works Association, American Society of Civil Engineers and the Chicago Engineers Club. For the past 30 years he has been treasurer of the Federation of Sewage & Industrial Wastes Associations.

• **Researcher and author**—John R. Baylis has one of the most varied and challenging jobs in the waterworks profession. He runs the largest filtration plant in the world, and in conjunction with it, the largest research operation of any water purveyor. Indeed, the South District plant is often classed as the world's largest experimental plant.

Before coming to Chicago in 1926, Mr. Baylis spent ten years at Baltimore's Montebello filtration plant where by virtue of living on the grounds and working 70 to 80 hours a week, he pioneered in several phases of water treatment research. Experiments with surface wash arrangements convinced him it was the most hopeful means of keeping filter beds in good condition. And he was right. The use of surface wash systems is now general practice in filtration plants.

In 1919 he began adding lime to water to control pipeline corrosion, and since then has published a great number of articles relating to corrosion and corrosion prevention. In fact, Author Baylis has published over 175 technical articles in his half-century-plus career.

At Baltimore, he had difficulty in measuring low turbidities in water and so in 1922 and 1923 he perfected turbidimeters of the desired sensitivity.

A 1905 civil engineering graduate of Mississippi State College, Mr. Baylis spent his early career supervising construction of railroad, sewage and water treatment works plants. An honorary member of AWWA and holder of its John M. Goodell Award, he has won the James Laurie Prize of ASCE and was twice awarded the Dexter Brackett Medal by the New England Water Works Association.

As an author, he has now achieved a leading and most enviable journalistic position. In essence, the Chicago Bureau of Water's monthly publication, "Pure Water", has become the personal journal of John R. Baylis. For so numerous are his past unpublished and current investigative experiences that he has taken to writing about them almost monthly to the delight and edification of the profession.

• **Big business**—As Chicago's assistant chief water engineer, H. H. Gerstein's duties are primarily of a management nature involving long-range planning and overall supervision of operations of this country's second largest water system, a $43 million a year business.

He received a chemical engineering degree in 1922 from Armour Institute of Technology and a professional degree of chemical engineering in 1937. He is a career man with Chicago, working up from junior sanitary engineer in the Water Department to chief filtration chemist at the South District Filtration Plant, and then to his present position in 1953, interrupted by three years in the Army Sanitary Corps during World War II, where he achieved the rank of major.

A most important responsibility of Hy Gerstein's office is to keep tabs on water rates and increases. About a year ago, the Water Department had little trouble in gaining an increase from 12 to 16 cents per 1,000 gal, the latter rate covering all operating and capital improvement costs of the water system —at least for the time being.

Mr. Gerstein's studies of the true cost of non-conserved air conditioning cooling water in Chicago have attracted nationwide attention. He has shown (ENR Apr. 25, 1957, p. 84) that revenues from this water will not begin to pay the capital costs of additions to pumping plants to meet the peak demand for cooling water which is coincident with the peak demand for

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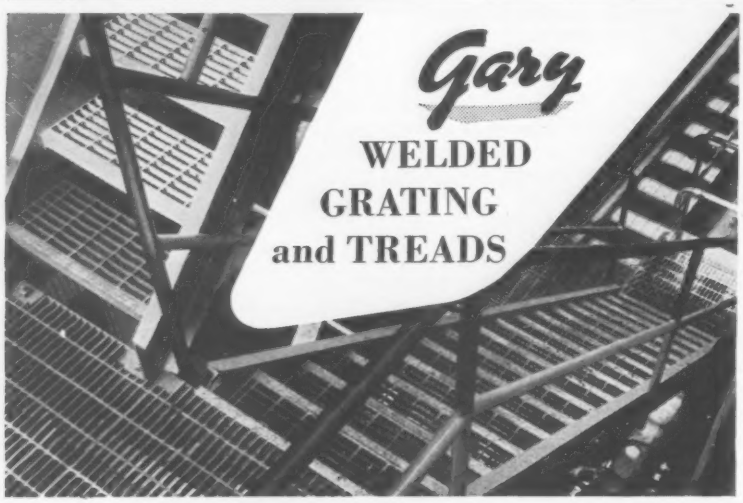

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. . . Chicago research

MICROSCOPE is aid to quick bacterial determination observes H. H. Gerstein.

other uses. Chicago and a number of other "cheap water" cities are moving to force installation of cooling water conservation devices by asking for a demand charge to cover the true cost.

Mr. Gerstein is a life member, national director and past chairman of the Purification Division of AWWA. A certified sanitary engineer, his most recent honor was AWWA's Management Division Award for 1958 for the above-mentioned paper on air conditioning cooling water costs.

• **And more research**—In keeping up with the times, the city has budgeted $100,000 for the purchase of an electronic computer for pipeline network analysis. The choice of either an analog (network analyzer) or digital-type computer has not yet been made.

Chicago has extended its research effort beyond the South District plant. The city's plumbing laboratory devotes considerable attention to new plumbing fixtures and the problem of backsiphonage. Manufacturers have taken a great interest in this work since a sizeable amount of research performed under the supervision of the Chicago trio has pointed the way to improving waterworks equipment.

It is obvious that Chicago is spend-

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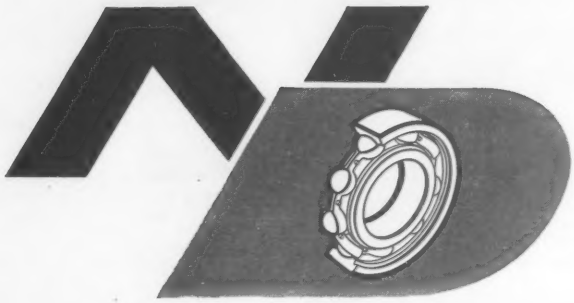

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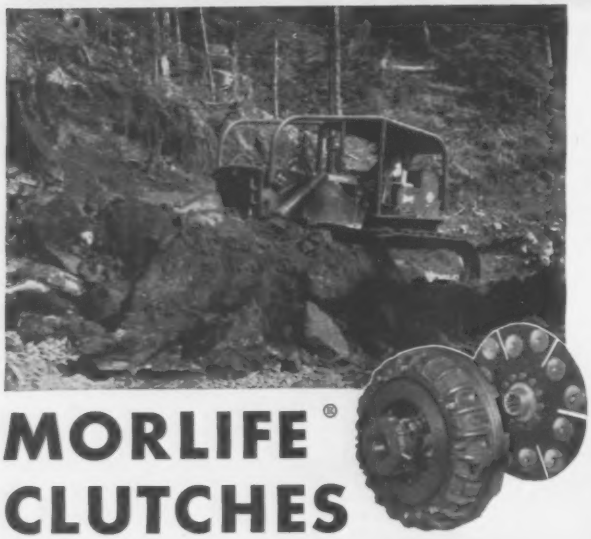

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. . . Chicago research

ing a great deal on research, even in proportion to its mammoth water supply operation. The Messrs. DeBarard Baylis and Gerstein are quick to pay tribute to Mayor Richard J. Daley and Water Commissioner Jardine and their predecessors for recognizing the great value of the program and not flinching when asked to provide money.

Judging from the citations Chicago's work has received over the years, the rest of the nation's waterworks industry also recognizes its great value.

Careers

Business

Earl K. McDaniel has opened a land surveying office in Royal Oak, Mich. His last position, prior to opening his own firm, was as supervisor of surveying for Ford Motor Co., Dearborn, Mich.

Leo A. Porter has been appointed chief engineer for Capitol Engineering Corp. of Dillsburg, Pa. In his new position he will be closely associated with the design of bridges throughout the Eastern states, and will act as consultant on the firm's foreign operations. He was chief bridge engineer for the Pennsylvania State Highway Department for 11 years, and is a 1917 structural engineering graduate of Tufts College.

Nomer Gray, since 1952 an associate with the consulting engineering firm of Ammann & Whitney, has become a partner. He has handled construction supervision for the company on such projects as the New Jersey, Ohio and Connecticut Turnpikes.

Lawrence L. Critcher is the new president of Wilkes Engineering Co. of North Wilkesboro, N. C. He succeeds **L. G. Critcher.**

John E. Hirten, Jr., assistant director of urban renewal for the Little Rock Housing Authority, has resigned to become executive director of the newly formed Stockton, Calif., Redevelopment Agency. He will be succeeded at Little Rock by **Paul D. Chapman**, formerly assistant planning supervisor.

A. N. Laird has become a partner in the consulting engineering firm of Plumb, Tuckett & Pikarsky, and will be in charge of the firm's Detroit office. He formerly was chief engineer of the Grand Trunk Western Railroad.

Ralph G. Bates, development engineer, has been promoted to general sales manager of Kaiser Engineers, division of Henry J. Kaiser Co., Oakland, Calif. He will direct sales activities of the division's engineering and construction services in the nuclear, petroleum, thermal power and minerals industries.

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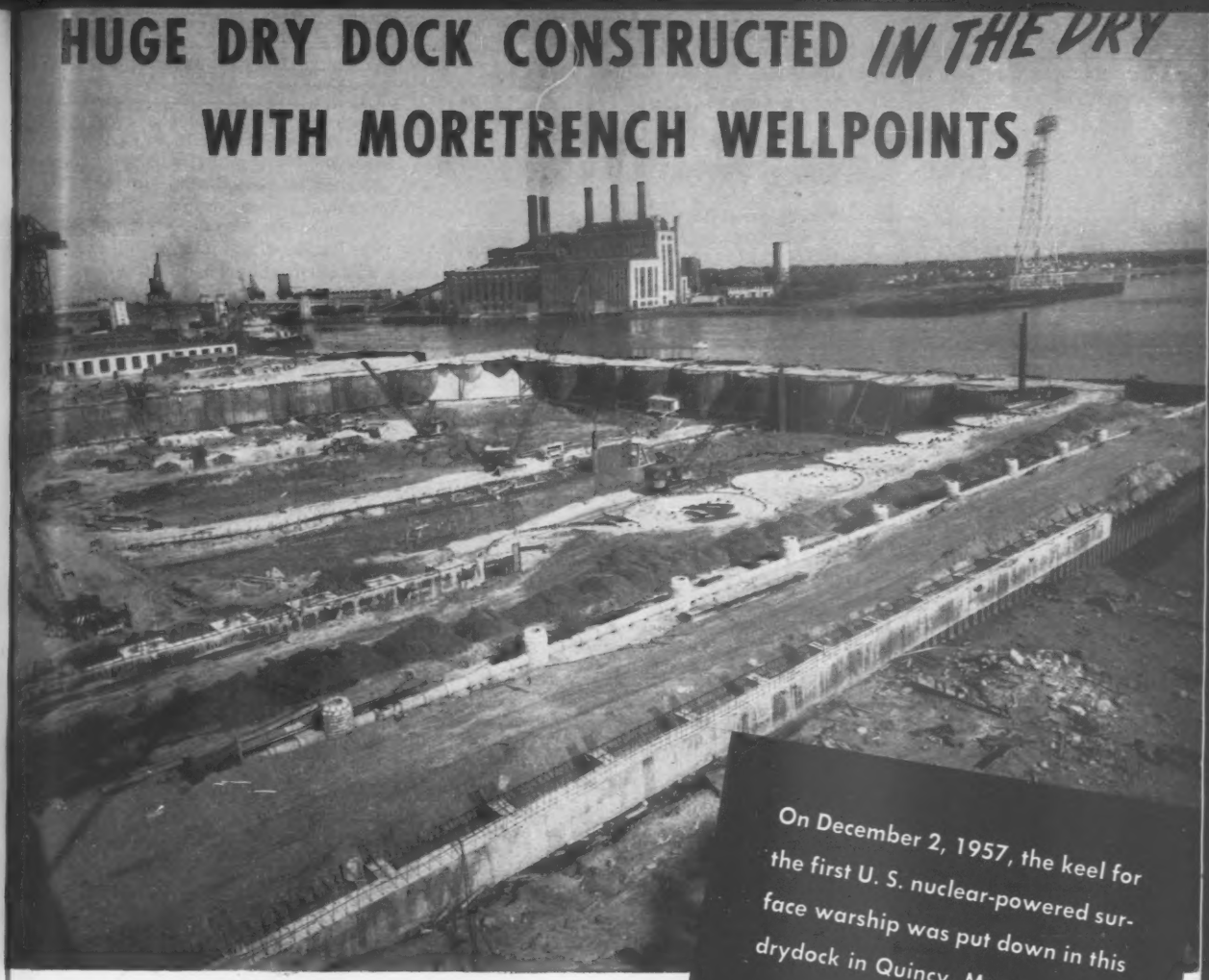

On December 2, 1957, the keel for the first U. S. nuclear-powered surface warship was put down in this drydock in Quincy, Mass.

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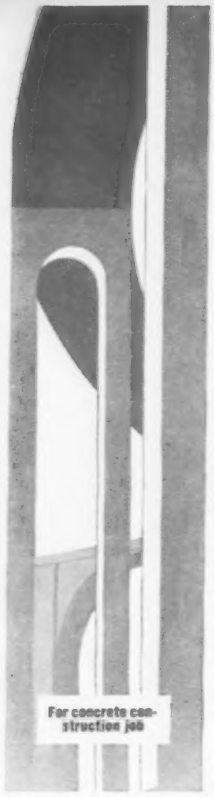

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Obituaries

B. F. de Barros Barreto, 57, a leading Brazilian hydro power engineer, died January 9 in Sao Paulo. He played a prominent role in the design and construction of the Cubatco, Nilo Pecanha and Paraiba Pirai projects. A 1922 graduate of Cornell University, he was a former president of the Brazilian Section of the American Society of Civil Engineers and was a frequent contributor to technical journals.

Elmer E. Hendricks, 65, who for 20 years was a principal in Miller & Hendricks Co., Indianapolis civil engineering firm, died January 14. He was a graduate of Purdue University.

Albert G. Pritchett, 75, a retired civil engineer for Lawyers Title Insurance Co., Richmond, died January 14. He was graduated from Virginia Polytechnic Institute.

Charles W. Sherman, 87, a retired partner of the Boston firm of Metcalf & Eddy, engineers, died January 17 in Cambridge, Mass. Mr. Sherman, who served as an assistant engineer when the firm was founded in 1907, retired as a partner in 1938 but continued as consulting engineer to the firm until 1942. He served on the Belmont, Mass., Board of Water Commissioners from 1908 to 1932, becoming chairman in 1925, and wrote numerous articles on waterworks engineering. He was an 1890 civil engineering graduate of Massachusetts Institute of Technology, received an M.S. degree there in 1891, and a M.C.E. degree from Cornell University in 1893.

Raymond T. Gleeson, 59, an architect, died February 3 in Philadelphia. A graduate of the University of Pennsylvania, he was a member of the Philadelphia architectural firm of Gleeson & Mulrooney.

Herbert W. Kueffner, 69, city public works director at Durham, N. C., since 1921, died February 18. He obtained a C.E. degree from North Carolina State College in 1908 and joined the City of Durham in 1914. He was a former president of the North Carolina Section of the American Society of Civil Engineers.

Thomas H. Hogg, 73, hydraulic engineer and former chairman of the Ontario Hydro-Electric Power Commission, died February 24 in Toronto. One of the early mainstays of the Canadian power agency, he joined Ontario Hydro in 1913, became chief engineer in

1927 and chairman in 1937. Following his resignation in 1947 after a disagreement with the Canadian premier on operation of Ontario Hydro, Mr. Hogg served as a consultant on numerous Canadian and foreign water resources schemes.

Joseph M. Kellogg, 66, vice president of Johnson, Drake & Piper, Inc., Minneapolis, Minn., died Feb. 15 in Denver, Colo. A specialist in heavy construction, he directed construction of the caissons and piers for the Huey P. Long Bridge over the Mississippi River at New Orleans and several other notable bridge caissons jobs. More recently he was project manager of the $14 million spillway contract at Garrison Dam on the Missouri River. Mr. Kellogg was a civil engineering graduate of the Royal Polytechnical Institute, Glasgow, Scotland and did graduate work at the University of Minnesota.

J. Harry Green, 70, manager of the Wisconsin Chapter of the Associated General Contractors, died February 6 in Fort Lauderdale, Fla. Mr. Green was a resident of Janesville, Wis., and had held the AGC post since 1936.

William H. Vance, 81, a retired civil engineer, died recently at Lyndon, Ky. He had been a civil engineer for the Missouri Pacific Railroad Co. before his retirement 10 years ago.

Carl Smedberg, 64, former city manager at Greensboro, N. C. died February 24 at Richmond. He was a former president of the North Carolina Section of the American Water Works Association and of the North Carolina Society of Engineers.

Frank B. R. Sahm, 83, chief engineer and architect for the Pennsylvania Department of Military Affairs at Indiantown Gap, Pa., died February 18 in Harrisburgh. He worked as an architect in Wilkes-Barre until 1939, when he became technical advisor to the head of the General State Authority, Harrisburg. Later, he was appointed to his military affairs post.

Arthur F. Lewis, 71, former secretary and engineer of the Cranston, R. I., city planning commission, died March 9. He had served on the commission for 16 years before retiring last September.

Anthony F. Rohlfing, 59, secretary of the Siesel Construction Co., Milwaukee, Wis., died March 3.

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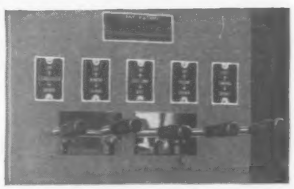

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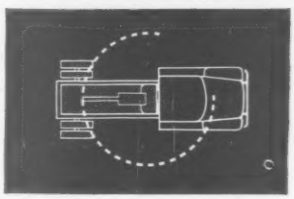

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Vital Data on U. S. Dams

REGISTER OF DAMS IN THE UNITED STATES —by T. W. Mermel. 429 pp. McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36. $12.50.

Where is Abbott Dam? Or Zwergle Dam? Or any one of over 2,800 other U.S. dams carrying a name between these alphabetical extremes? On what river is it located? Who owns it, who designed it and who built it? Of what type is it, and how long and high in feet and big in cubic yards? When was it completed, how much water does it store, and how much, if any, power does this water generate when discharged?

The answers to these questions are available for the first time in this unusual book sponsored by the United States Committee of the International Commission on Large Dams, and planned and prepared by T. W. Mermel as an extracurricular activity to his position as Assistant to the Commissioner, Engineering, in the U. S. Bureau of Reclamation. From extensive and voluminous correspondence and painstaking research over several years, Mr. Mermel has developed a compilation that contains more than 2,800 listings arranged alphabetically for easy reference.

For those who may not only be interested in the vital statistics about a dam, but in what it looks like, the book also can be of service, for 314 of the dams are pictured. And as a further evidence of its encyclopedic character, it lists the one hundred highest dams, the one hundred largest dams and there is also a summary of the laws in each of the 48 states relating to the type of control exercised over dam design, together with the names and addresses of the officials or agency that exercises the control.

Properties of Materials

ENGINEERING MATERIALS HANDBOOK—Edited by Charles L. Mantell. 1936 pp. McGraw-Hill Book Co., New York, Toronto, London. $21.50

More than 150 specialists contributed to this comprehensive reference work covering the behavior of materials with which engineers and architects are likely to be concerned.

In its 43 sections are data on metals, organic and inorganic materials, and the cause and prevention of failure of materials.

Emphasis is placed on fabricated forms of materials, their advantages and limitations, and protection against deterioration.

In addition to the discussions of the characteristics of commonplace materials and extensive tables of useful data, the handbook also deals with new developments. Special sections report on materials of construction for apparatus for control and utilization of atomic forces and fission products, such as materials needed for insulation of nuclear reactors against X rays, gamma rays, beta particles and fission products. New concepts of material utilization in rockets (short-time high-temperature use) are contrasted with industrial application (long-time high-temperature use).

A very useful section of the book lists sources of information on engineering materials. Specifications, standards, methods of tests, codes and inspection also are discussed in this section.

Reports and Pamphlets

THERMAL CONDUCTIVITY PROPERTIES OF SOME MASONRY BUILDING MATERIALS—University of Arizona Press, West Stadium, Tucson, Ariz. 30¢.

HYDRAULIC RESEARCH IN THE UNITED STATES—220 pp. Superintendent of Documents, U.S. Government Printing Office, Washington 25, D. C. $1.50.

WATERBORNE COMMERCE OF THE UNITED STATES—Part 2: Waterways and Harbors Gulf Coast, Mississippi River System and Antilles. 209 pp. Division Engineer, U.S. Army Engineer Division, Lower Mississippi Valley, P. O. Box 80, Vicksburg, Miss. $1.00

U.S.A. CONTRIBUTIONS TO THE EUSEC CONFERENCE PARIS, FRANCE, SEPTEMBER 16–20, 1957—Published for Engineers Council for Professional Development by The American Society of Mechanical Engineers, 29 W. 39th St., New York 18. $5.00.

TRENDS IN EDUCATION AND UTILIZATION OF TECHNICAL MANPOWER—Council for Technological Advancement, 1200 Eighteenth St., N.W., Washington 6, D. C.

GROUNDWATER GEOLOGY IN WESTERN ILLINOIS, SOUTH PART—Circular 232. Illinois State Geological Survey, Urbana, Ill.

TENTATIVE SPECIFICATIONS FOR COPPER AND COPPER-ALLOY WELDING RODS—American Welding Society, 33 W. 39th St., New York 18. 40¢.

ATOMIC ENERGY FACTS—216 pp. Superintendent of Documents, U.S. Government Printing Office, Washington 25, D. C. $2.00.

BASIC RESEARCH—A NATIONAL RESOURCE —Superintendent of Documents, U.S. Government Printing Office, Washington 25, D. C. 45¢.

BEHAVIOUR OF METALS AT ELEVATED TEMPERATURES—122 pp. Philosophical Library, Inc., 15 E. 40th St., New York 16. $6.00.

EXPLANATORY HANDBOOK ON THE BRITISH STANDARD CODE OF PRACTICE FOR REINFORCED CONCRETE—154 pp. Concrete Publications Ltd., 14 Dartmouth St., London S.W.1, Eng. $3.00.

ECONOMICS OF ATOMIC ENERGY—by Mary S. Goldring. 179 pp. Philosophical Library, Inc., 15 E. 40th St., New York 16. $6.00.

TECHNICAL REPORT WRITING—James W. Souther. 70 pp. John Wiley & Sons, Inc., 440 Fouth Ave., New York 16, $2.95.

SYMPOSIUM ON THE OBSERVATION OF STRUCTURES (Two volumes)—Laboratorio Nacional de Engenharia Civil, Av. do Brasil, Lisboa, Portugal. $10.50.

REPORT OF THE VTH INTERNATIONAL CONGRESS FOR BRIDGE AND STRUCTURAL ENGINEERING—(Two volumes) — V Congresso Internacional de Pontes e Estruturas, Av. Rovisco Pais, Lisboa, Portugal. Volume I: Members $8.80; non-members $10.45. Volume II: Members $6.95; non-members $8.80.

SYMPOSIUM ON THERMAL CONDUCTIVITY MEASUREMENTS AND APPLICATIONS OF THERMAL INSULATIONS—Technical Publication No. 217. 86 pp. American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. $2.75.

BASIC ELECTRIC CIRCUIT THEORY—650 pp. Ronald Press Co., 15 E. 26th St., New York 10, N. Y. $9.00.

ENGINEERING MATERIALS HANDBOOK—1,936 pp. McGraw-Hill Book Co., 330 W. 42nd St., New York 36. $21.50.

PARKING—401 pp. The Eno Foundation for Highway Traffic Control, Saugatuck, Conn.

STATICALLY-INDETERMINATE STRUCTURES—by R. Gartner. 126 pp. Concrete Publications Limited, 14 Dartmouth St., London S. W.1, Eng. $4.00.

PLANT DESIGN AND ECONOMICS FOR CHEMICAL ENGINEERS—by Max S. Peters. 511 pp. McGraw-Hill Book Co., 330 W. 42nd St., New York 36. $11.00.

INFLUENCE LINES FOR CONTINUOUS BEAMS —by Walter C. Boyer and Joel I. Abrams. 135 pp. Johns Hopkins Press, Homewood, Baltimore 18, Md. $10.00.

MANAGEMENT FOR ENGINEERS—by Roger C. Heimer. 453 pp. McGraw-Hill Book Co., 330 W. 42nd St., New York 36. $6.75.

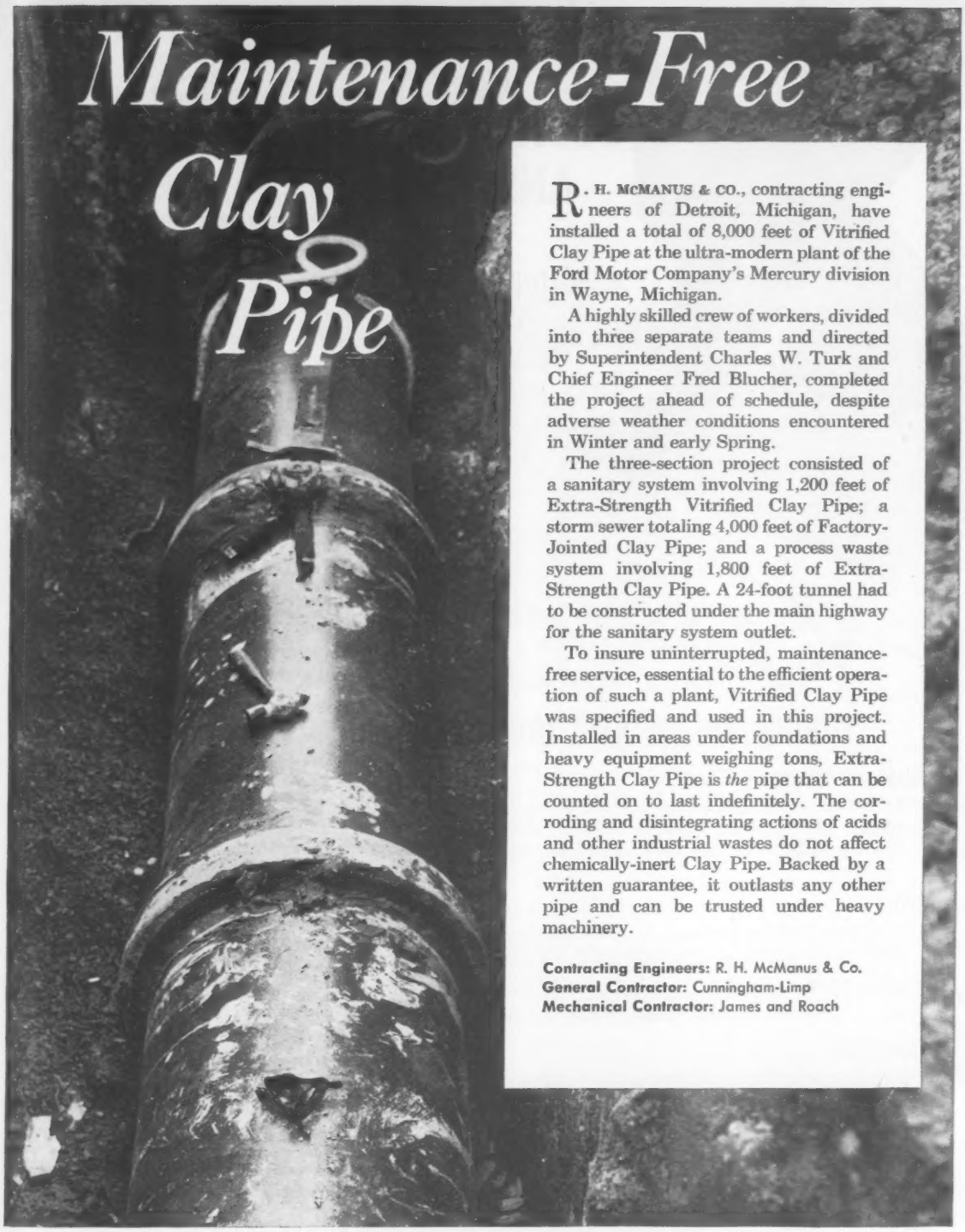
MOTION AND TIME STUDY—by Ralph M. Barnes. 665 pp. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16. $9.25

BRIDGES—by David B. Steinman & Sara Ruth Watson. Revised edition (paperbound). 401 pp. Dover Publications, Inc., 920 Broadway, New York 10. $1.95.

TUNNELS, UNDERGROUND STRUCTURES AND AIR RAID SHELTERS—by A. A. Eremin. 32 pp. A. A. Eremin, 1541 37th St., Sacramento 16, Calif. $5.00.

THE PRACTICE OF CONSULTING ENGINEERING—Report No. 106. Engineers Joint Council, 29 W. 39th St., New York 18. $1.50.

INVENTORY OF MUNICIPAL AND INDUSTRIAL WASTE FACILITIES IN CONNECTICUT—



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General Contractor: Cunningham-Limp
Mechanical Contractor: James and Roach

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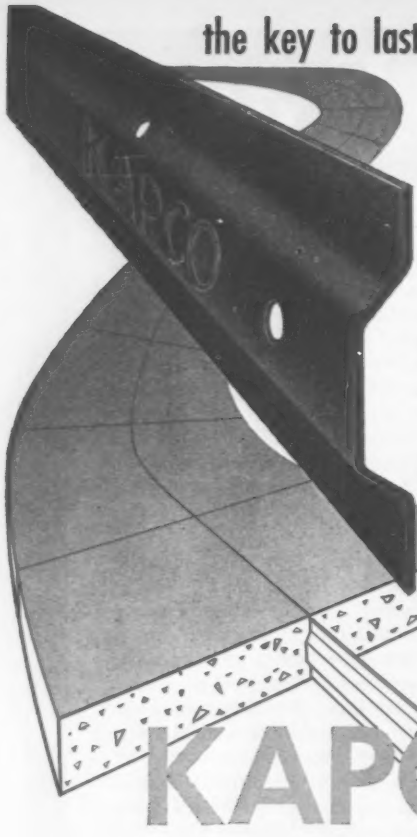

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. . . Books

THERMAL STRESSES—by B. E. Gatewood. 232 pp. McGraw-Hill Book Co., 330 W. 42nd St., New York 36. $7.50.

STRENGTH OF MATERIALS—by F. R. Shanley. 783 pp. McGraw-Hill Book Co., 330 W. 42nd St., New York 36. $8.50.

Public Health Service, Division of Water Pollution Control, Washington, D. C.

A SURVEY OF RADIOACTIVE WASTE DISPOSAL—Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. 50¢.

AMERICAN DRAFTING STANDARDS MANUAL: Section 3—Projections, ASA Y14.3–1957, $1.50; Section 6—Screw Threads, ASA Y14.6–1957, $1.50. American Society of Mechanical Engineers, 29 W. 39th St., New York 18.

GRAPHICAL SYMBOLS FOR USE ON RAILROAD MAPS AND PROFILES—ASA Y32.7–1957. American Society of Mechanical Engineers, 29 W. 39th St., New York 18. $1.50.

INDUSTRIAL WATER AND INDUSTRIAL WASTE WATER—Special Technical Publication No. 207. 52 pp. American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. $2.00.

DAYLIGHT THROUGH THE MOUNTAIN—by Frank Walker. 442 pp. Published by The Engineering Institute of Canada; available in U. S. at Pitman Publishing Corp., 2 W. 45th St., New York 36, N. Y. $6.00.

GLOSSARY OF HYDROLOGIC TERMS USED IN ASIA AND THE FAR EAST—Flood Control Series No. 10—38 pp. International Documents Service, Columbia University Press, 2960 Broadway, New York 27. 40¢.

MULTIPLE-PURPOSE RIVER BASIN DEVELOPMENT—Part 2B: Water Resource Development in Burma, India and Pakistan—Flood Control Series No. 11. 135 pp. International Documents Service, Columbia University Press, 2960 Broadway, New York 27. $1.50.

DYNAMIC INSTABILITY—by Y. Rocard. 227 pp. Frederick Ungar Publishing Co., 105 E. 24th St., New York City. $9.50.

ELEMENTS OF WATER SUPPLY AND WASTE-WATER DISPOSAL—615 pp. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16. $8.95.

HYDRO-ELECTRIC PROGRESS IN CANADA, 1957—Bulletin No. 2598. Director, Water Resources Branch, Department of Northern Affairs and National Resources, Ottawa, Canada.

ELECTRICAL CONSTRUCTION COST MANUAL—by Ralph E. Johnson. 431 pp. McGraw-Hill Book Co., 330 W. 42nd St., New York 36, N. Y. $10.00.

COVERED BRIDGES OF THE NORTHEAST—by Richard Sanders Allen. 121 pp. Stephen Greene Press, 120 Main St., Brattleboro, Vermont. $5.95.

ESTIMATING GENERAL CONSTRUCTION COSTS—Second edition, by Louis Dallavia. 197 pp. F. W. Dodge Corp., 119 W. 40th St., New York. $8.50.

THE BUILDING ESTIMATOR'S REFERENCE BOOK—by Frank R. Walker. 1,780 pp. Frank R. Walker Co., 173 West Madison St., Chicago 2, Ill. $13.50.

How Research Shapes Our Future Prosperity

If you are looking for an industry that is going to keep on booming in 1958 and every year for the next decade, here it is. It is the industry of technological innovation through research and development.

Last year this great new industry spent over $7 billion to discover and develop new industrial products, processes and equipment. This year the preliminary McGraw-Hill survey indicates that total expenditures for industrial research and development will be even greater, perhaps as much as $8 billion. Of the companies surveyed, 57% plan to spend as much as in 1957 and 38% plan to spend more.

The sustained expansion in research and development is the best guarantee we have that the current decline in business investment in new plants and equipment will be relatively short-lived. There can be no prolonged decline in investment in an economy where technology is changing rapidly.

This editorial is designed to show how the continued surge in research and development can be expected to lead first to new products, and eventually to renewed expansion of investment in new industrial plants and equipment. Such expansion is the essence of national economic growth.

A Slow Start

The impact of research on sales and investment is still very gradual. Research spending itself has more than doubled in the last four years. But only 32% of all manufacturing firms report significant capital outlays to make new products. We are not reaping the full dividends of industrial research as yet for several reasons:

- Research expenditures were relatively small until the Korean War of 1950 brought substantial government contracts in aviation, electronic and related fields. Heavy research outlays for civilian and industrial products came even later.

- There is an average *lag*, according to research directors consulted by the McGraw-Hill Department of Economics, of roughly seven years from the start of research until the product is ready for large scale output — about five years of research and at least two years to solve production problems and develop markets.

- Complex products, such as new consumer durables and industrial machinery, have an even longer time lag.

However, new developments are certainly underway. Research began to increase in all lines of business when Korean War restrictions and

the excess profits tax came to an end in 1953. The tax revision of 1954 added a new incentive by making research outlays deductible as a current business expense. By 1955, the research boom was on.

When Is The Payoff?

With a lag of about seven years, it will be the early 1960s before these new developments become a dominant factor in capital investment. But once the flow of new products and new processes starts, it will accelerate sharply — just as research spending has accelerated in the past few years.

By 1960, over $50 billion in sales will be coming from products not on the market as recently as 1956. Sales of new products will increase year by year, but they will gain most in 1960-1962, or five years after the recent spurt in research expenditures.

Capital expenditures to manufacture new products will also rise, but with a slightly longer lag. Here the sharpest rise should come in 1962-1965, as the new products reach a volume that calls for a significant amount of new capacity. In most cases, initial output of new products will come from existing capacity.

This timing of a new wave in capital investment appears logical on other grounds. Population experts forecast an upsurge in marriages and births around 1965. So by 1962, industry will be starting to tool up for new mass markets.

The important point is this: As we approach the 1960s more and more sales and investment will be in new products growing out of research. By 1960 well over 10% of manufacturing sales will be in new products not on the market in 1956.

Meanwhile — research will help stabilize capital spending by raising the level of modernization and replacement expenditures. Of course, research does not eliminate all the ups and downs in the demand for capital goods, for there remain variations in the amount spent to expand capacity. But a high level of modernization, to cut costs and improve quality, does put a floor under any drop in investment.

What To Expect

During the next few years we can expect an increasing flow of new materials, new metallic alloys, new machinery — primarily those developments coming out of long-established research programs in the chemical and electrical industries. Industry will make wider use of specialized computers and automated equipment.

But the dramatic payoff on research comes even later. In the early 1960s the consumer goods industries will begin tooling up for their really new products — things so basically new they can change the way a family lives. Such items as plastic houses, paper apparel, turbine autos are under development right now. But it will take several years to get costs down and for population and incomes to grow to the point where mass markets are created.

When we reach that point in the mid-1960s, there will begin the greatest surge of capital investment in all history. And then — around 1965 — the new processes (full automation, atomic power, continuous steel casting) which are the slowest and most expensive part of the research chain to develop, will come into play.

The combined impact of new products and new processes, to meet an expanding market, will thus be felt in the mid-1960s — eight to ten years after the recent sharp increase in research spending. The full impact is that far away because of the lags for applied research, pilot plant studies and market introduction. But to a large degree the prosperity of the 1960s has already been shaped by the research programs now underway.

This message is one of a series prepared by the McGraw-Hill Department of Economics to help increase public knowledge and understanding of important nation-wide developments. Permission is freely extended to newspapers, groups or individuals to quote or reprint all or parts of the text.

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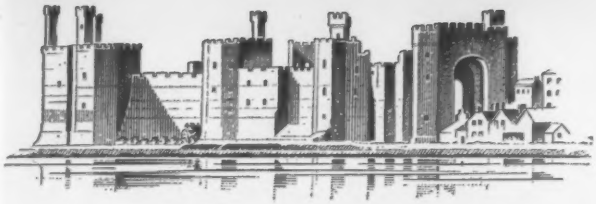

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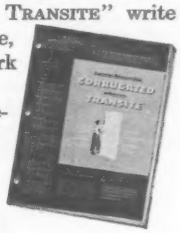

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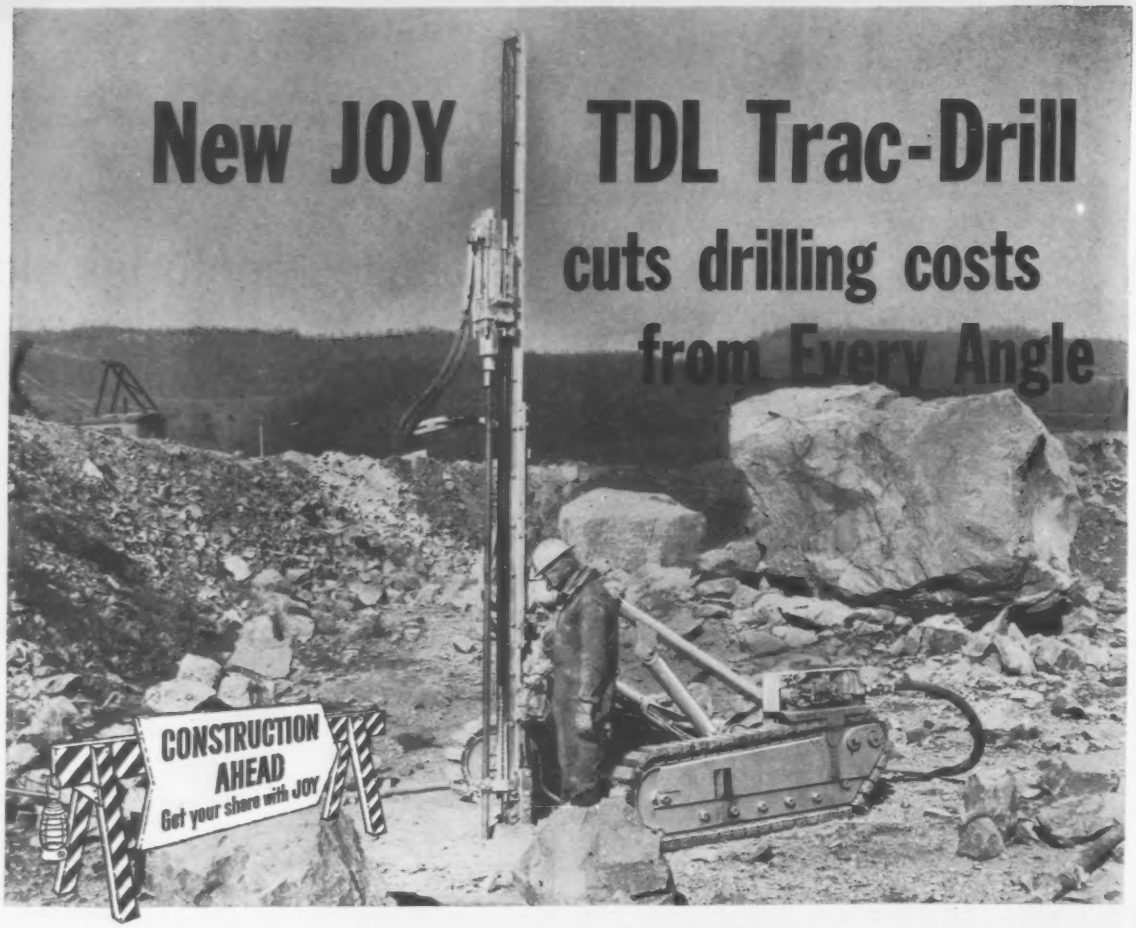

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Drainage and Resurfacing of Delaware Roads

Cost of widening and resurfacing national and interstate defense highway is $46,572 per mile

On a bid of $9 a ton for 13,000 tons of hot-laid asphaltic concrete, George & Lynch, Inc., Wilmington, Del. emerged the successful bidder for the $249,346 contract (an average of $46,572 a mile) for widening and resurfacing 5.354 miles of road in Bridgeville, Del., to Route 42. This road is part of the National System of Interstate and Defense Highways.

The contract includes 10 and 13 ft soil cement widening, and resurfacing 22 ft roadway with 3 in. hot-mix, hot-laid asphaltic concrete.

This is one of two contracts awarded by the Delaware State Highway Department for work on Bridgeville roads.

Richard A. Haber is chief engineer of the state highway department and G. W. Vanderslice is administrative assistant of the Federal-aid Division.

The contractors furnish all materials, and must pay for maintaining traffic.

Minimum wages on these jobs range from a high of $1.50 for skilled labor, through $1.25 for semi-skilled, to $1.00 for unskilled laborers.

The six bids on the roadway widening and resurfacing went like this.

1C	George & Lynch, Inc., Wilmington, Del.	$249,346
2	Standard Bitulithic Co., Middletown, Del.	271,665
6	Wilson Contr. Co., New Castle, Del.	332,640

Bids: 11-6-57 Items	Unit	Quantity	Unit Prices 1C	 2
Clear & grub	ls	job	$2,000	$4,000
Excavation	cy	9,000	0.60	0.82
structural	cy	250	2.00	0.01
Masonry, exist CC, remove	cy	40	10.00	10.00
Borrow	cy	11,000	0.60	0.90
pit stripping	cy	500	0.01	0.01
select	cy	6,000	1.00	1.10
Asph conc pav, hot mix hot laid	t	13,000	9.00	10.00
RC-1	gal	900	0.165	0.16
3	gal	8,500	0.165	0.16
Slag chips	t	50	6.50	6.50
Crushed chips	t	50	6.50	6.50
stone or gravel	t	100	6.50	6.50
Portland cem conc pav, patch	sy	55	10.00	10.00
substruct masonry	cy	230	60.00	69.00
Waterproofing, superficial	sy	190	2.00	1.00
Bar reinforcmt, substruct	lb	7,500	0.12	0.12
RCP, 12"	lf	1,450	3.00	2.50
15"	lf	650	3.50	3.50
18"	lf	70	4.00	5.00
48"	lf	30	19.00	21.00
Timber piles, untreated	lf	2,000	2.50	2.25
test	lf	200	2.50	4.50
Wood shoulder curb	lf	2,500	0.60	0.58
CM downspouts, 8"	lf	250	2.00	1.00
Gd fence, wire rope, wood post	lf	2,500	1.80	1.80
End post attachments	ea	8	40.00	40.00
Seeding	ac	12	250.00	200.00
Mulching	sy	57,000	0.06	0.08
Sand	t	360	4.00	3.60
Lateral ditching	lf	1,900	1.00	1.00
Calcium chloride	t	5	50.00	5.00
Asph tack coat, RC-1	gal	7,300	0.165	0.16
Soil cement base course	sy	39,000	0.25	0.16
Portland cement	bbl	3,800	4.95	5.85
Prestressed, precast conc, reinforced, bridge deck	ls	job	28,000	29,350
Aluminum bridge railing	lf	140	10.00	6.82
Bridges, existing remove	ls	job	2,000	1,000
Borrow, select, trm	cy	200	1.00	1.50

Bids: 11-6-57 Items	Unit	Quantity	Unit Prices 1C	 2
Asph conc, hotmix hot laid, trm	t	100	0.01	10.00
Bit conc, cold laid, trm	t	100	0.01	10.00
Maintaining traffic	ls	job	1,000	2,000

Start: 12-2-57. Complete: 8-15-58
Liquidated damages: $60/day
trm Temporary road materials

The $81,363 contract for draining 0.732 mile of streets in Bridgeville, went to James Julian, Inc., Elsmere, Del., on a bid only a fraction of a per cent below the second bid but more than 43% below the high of the six bids.

The bidding on the drainage contract went like this:

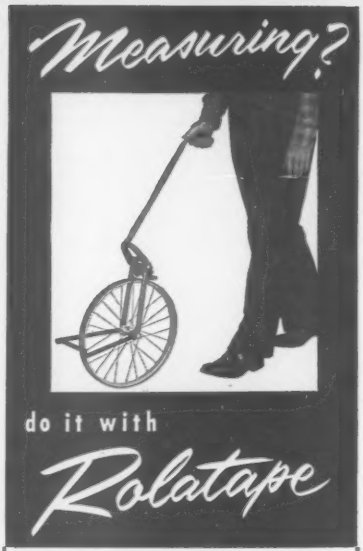
1C	James Julian, Inc., Elsmere, Del.	$81,363
2	George & Lynch, Wilmington, Del.	81,680
6	Wilson Contr Co., Inc., New Castle, Del.	138,901

Bids: 11-6-57 Items	Unit	Quantity	Unit Prices 1C	 2
Clear & Grub	ls	job	$600.00	$600.00
Excavation	cy	2,000	1.00	0.70
Borrow, select	cy	1,500	1.50	1.00
Asph conc, hot mix, 2"	t	700	10.75	10.00
RC-1	gal	600	0.19	0.17
3	gal	600	0.19	0.17
Crushed stone	t	30	7.25	7.00
chips	t	30	7.25	7.00
Portland cem conc pav, patch	sy	700	10.00	10.00
RC pipe, 12"	lf	66	4.50	3.30
15"	lf	417	4.60	4.00
18"	lf	432	5.30	5.00
30"	lf	1,212	10.00	9.45
42"	lf	54	17.00	16.50
48"	lf	1,076	19.40	20.20
60"	lf	387	27.20	29.50
VCP, 4"	lf	100	2.00	1.00
6"	lf	100	2.00	1.00
8"	lf	100	2.00	1.00
Portland cem conc sidewalk, 4"	sf	500	0.50	0.50
Catch basin, tp 8	ea	14	100.00	116.00
MH, standard	ea	5	200.00	406.00
tp 2	ea	6	300.00	435.00
Minor adjustments & repairs	ea	21	40.00	10.00
Castings	lb	10,600	0.10	0.13
Topsoil	sy	2,420	0.25	0.25
Seeding	ac	0.5	200.00	500.00
Lateral ditching	lf	200	1.00	1.00
Asph Tack Coat, RC-1	gal	1,200	0.18	0.17
Cutoff wall & outlet apron	ls	job	400.00	261.00
Junction box, tp 2 special	ea	2	200.00	243.00
Asph conc curb	lf	2,800	0.70	0.75
Storm sewer field connect.	ea	5	150.00	20.00
Maintaining traffic	ls	job	600.00	1,000

Commence: 1-20-58 Complete: 5-15-58
Liquidated damages, $40/day

Costs Per Mile of Kentucky Highways—1957

Type	State & Federal Miles	State & Federal Cost per Mile	Rural & Secondary Funds Miles	Rural & Secondary Funds Cost per Mile
Pulling ditches	30.400	$334	.....	.....
Grade & drain	55.819	54,034	20.184	$19,084
& T. B, macadam	70.071	42,400	134.527	19,247
Bit road mix (part with seal)	499.137	7,360	516.952	7,369
conc, Cl I	805.076	21,470	42.701	10,061
penet macadam	.....	.....	1.900	12,118
Rock asph surf	1.773	79,946	.....	.....
Cement conc pave	1.744	221,282	.....	.....



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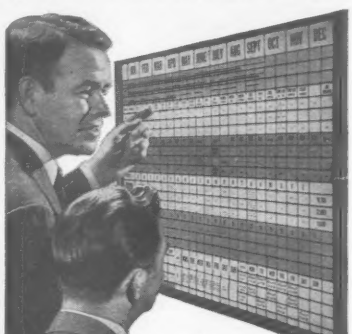

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Materials and Labor Prices

Market Quotations by ENR Field Reporters

See following ENR issues for OTHER PRICES:

- Wood Products, Glass, Explosives, Chemicals: Last, Mar. 20; Next, Apr. 24
- Clay Products, Lime, Plaster, Paint, Roofing: Last, Mar. 27; Next, May 1
- Wage Rates, Building Board, Lath, Insulation: Last, Mar. 27; Next, May 1
- Cement, Aggregate, Ready-Mixed Concrete, Asphalt: Last, Apr. 3; Next, May 8

IRON AND STEEL PRODUCTS—PER 100 LBS. BASE MILL PRICES

	STRUCT SHAPES—	PLATE CARBON STEEL	REINF BARS* billet	RIVETS ½-in. struc-tural	SHEET PILING Base	STEEL RAILS Per Net Ton Standard	STEEL RAILS Per Net Ton Light	TRACK SUPPLIES Angle Bars	TRACK SUPPLIES Std Spikes	TRACK SUPPLIES Tie Plates	TRACK SUPPLIES Track Bolts
Birmingham Area	$5.275	$5.10	$5.425	$12.25	.....	$110.50	$130.00	$6.975	$9.75	$5.60	.....
Chicago Area	5.275	5.10	5.425	12.25	$6.225	110.50	130.00	6.975	9.75	6.60	.....
Pittsburgh Area	5.275	5.10	5.425	12.25	6.225	110.50	130.00	6.975	9.75	6.60	$14.75
Buffalo Area	5.275	5.10	5.425	12.25	6.225	110.50	130.00	6.975	9.75	6.60	14.75
Cleveland	.....	.....	5.425	12.25	6.225	.....	.....	.....	.....	.....	14.75
Youngstown Area	.....	.....	5.425	.....	.....	.....	.....	.....	9.75	.....	.....
Geneva	5.275	5.10	.....	.....	.....	.....	.....	.....	.....	.....	.....
Los Angeles	5.975	.....	6.125	.....	6.225	.....	.....	.....	9.75	6.75	.....
Pueblo	.....	.....	.....	.....	.....	.....	.....	69.75	9.75	6.60	.....

* Fairless Works, $5.575.

IRON AND STEEL PRODUCTS—F.O.B. WAREHOUSE, PER 100 LBS., BASE PRICE

	STRUCTURAL SHAPES Per 100 lb. base price	REINFORCING BARS Per 100 lb., base price 5 tons to carload lot New billet	REINFORCING BARS Rail steel	EXPANDED METAL LATH Per 100 sq. yd., carload lots Std. diamond mesh. 3.4 lb.	EXPANDED METAL LATH Std. ribbed 3.4 lb.	WELDED FABRIC REINFORCING Per 100 sq ft., carload lots fob mill
Atlanta	$9.05	9.25	$9.01‡	$52.00	$57.00	
Baltimore	9.45	8.45j	....	42.00	46.50	
Birmingham	8.64y	8.60y	8.60y	57.00p	63.00p	
Boston	9.63a	8.25	8.25	46.50	51.00	
Chicago	8.79E	6.91gu	6.91gu	52.00‡	53.00‡	
Cincinnati	9.15ak	9.08rs	....	43.50mn	48.00mn	
Cleveland	9.01	6.89c	....	44.50‡	49.00‡	
Dallas	9.25	7.75	7.75	44.00	48.50	
Denver	9.90	8.95c	....	57.00n	63.00n	
Detroit	9.18	7.15g	....	45.00	49.50	
Kansas City	9.31a	8.10	....	49.00	60.00	
Los Angeles	8.50fdR	7.35	....	57.00	63.00	
Minneapolis	9.08d	9.25b	9.25b	42.50	48.00	
Montreal	7.90-8.10CC/8.20-8.90A	7.00/7.50FG	7.00/7.50FG	65.70h	70.20h	
New Orleans	....	8.00pks	....	45.50	50.00	
New York	9.45‡z	8.35g	8.35g	50.50n	57.00no	
Philadelphia	8.80/9.00	7.80/8.00	....	42.50‡	47.00‡	
Pittsburgh	8.64y	7.10g	....	46.00‡w	49.50‡w	
St. Louis	9.10s	8.45c	8.45c	61.00l	62.00l	
San Francisco	9.50	9.45j	....	51.00	55.00	
Seattle	9.80aD	8.85e	....	63.50nr	68.00nr	
Toronto	8.85*	7.85	7.85	61.60nq	66.00nq	

EXTRAS, per cwt—♦Quantity (applies to LCL shipments only): under 1,000#, +$1.80; 1000-1999#, +$1.50; 2000-4999#, +$1.20; 5000-9999#, +90¢; 10,000-19,999#, +60¢; 20,000-39,999#, +30¢; 30,000-39,999#, +10¢; 40,000# & up, none. ♦Size†: #2 +$2.50; #3 +$1.40; #4 +$1.00; #5 +70¢; #6, #7, #8, #9, #10, #11 +50¢. ♦Bending: heavy, +90¢; light +$2.20 (except in New York City and surrounding metropolitan area where bending must be done on the job). ♦Engineering (details and placing from designs by others): over 500 tons, +15¢; 200-499 tons, +50¢ but not over $4500; 75-199 tons, +65¢ but not over $2500; 20-74 tons, +75¢ but not over $975; 5-19 tons, +85¢ but not over $300; under 5 tons, +$1.00 but not over $85. Min. charge $25. Design only: +60¢.

Quantity extras, per cwt: under 100#, +$3; 100-399#, +$1; 400-999#, +$.80; 1000-1999#, +$.60; 2000-4999#, base price; 5000-9999#, —10¢; 10,000-19,999#, —30¢; 20,000-29,999#, —60¢; 30,000# and up, —70¢

WELDED FABRIC REINFORCING—4 × 16 in., No. 8 & 10 wires—Joliet, Ill., Donora, Pa., Monessen, Pa.: $3.08
4 × 12 in., No. 8 & 12 wires—Joliet, Ill., Donora, Pa., Monessen, Pa.: $3.63
6 × 6 in., No. 8 & 8 wires—Joliet, Ill., Donora, Pa., Monessen, Pa.: $4.17

*‡ Delivered. ** Aver. of Canadian & American. *a 2000-9999# *b 10,000-15,999# fob city *c 20 tons or over *d 10,000-19,999# *e Intermediate struct'l *f Incl. delivering in free zone *g CL *h list price; dominion tax exempt; add provincial and municipal taxes *i add dominion, provincial and municipal sales taxes *j intermediate and hard grade *k fob city *l delivered; contractor to do unloading *m copper alloy *n LCL *o asphalt coated *p del. of 500 sq. yd. or more. *q 3 lb *r 2% off for cash *s 2,000-4,999# *t add 16.5¢ del. *u add 7.5¢ switch *v incl 15¢ del. *w truck lots. *y add 15¢ del. *z add 10¢ del. *A American made. *C Canadian made. *D ½% for cash. *E 30,000 # or over. * F Federal tax exempt. *G add 10¢ switch. *R: revised

PLUMBING, HEATING, WATER, SEWER AND DRAIN PIPE

	C. I. PIPE PRICE INDEXπ	ASBESTOS CEMENT PIPE per lin. ft. f.o.b. city 6" Press Cl. 150	ASBESTOS CEMENT PIPE per lin. ft. f.o.b. city 12" Sew Cl. I	ASBESTOS CEMENT PIPE per lin. ft. f.o.b. city 12" Sew Cl. 2400	CLAY SEWER PIPE Per ft., delivered ASTM C13-54 8 in.	CLAY SEWER PIPE Per ft., delivered ASTM C13-54 12 in.	CLAY SEWER PIPE Per ft., delivered ASTM C200-55T 24 in.	CLAY SEWER PIPE Per ft., delivered ASTM C200-55T 36 in.	CLAY DRAIN TILE† Per 1,000 ft., car load lots, f.o.b. ASTM C4-55 6 in.	CLAY DRAIN TILE† Per 1,000 ft., car load lots, f.o.b. ASTM C4-55 8 in.	CONCRETE SEWER PIPE§ Per ft., delivered ASTMC 14-55 12 in.	CONCRETE SEWER PIPE§ Per ft., delivered ASTMC 14-55 24 in.
Atlanta	130.5	$1.56/1.64	$2.55	2.68	$.53	$.98	$....	$....	$209.00s	$334.00	$1.55m	$4.40m
Baltimore	140.4	1.56/1.64	2.35	2.54	.665	1.28	5.08r	12.71	187.80	289.20	1.01	2.75m
Birmingham	125.8	1.56/1.64	2.55	2.62	.46	.86	3.70w	10.37w	260.00‡	440.00‡	1.25m	2.75
Boston	143.5	1.58/1.66	2.35	2.54	.763qrt	1.4715qrt	6.075qrt	.....	215.40r	330.60r	1.56mg	3.47mg
Chicago	140.9	1.56/1.64	2.35	2.54	.93m	1.78m	7.52m	21.16m	220.00m	330.00m	1.30	4.00
Cincinnati	135.5	1.58/1.66	2.43	2.54	.665t	1.2825t	4.905t	12.505	240.00	370.00	.85m	3.25m
Cleveland	141.7	1.58/1.66	2.43	2.54	.567s	1.0935s	4.545t	11.7875t	155.40m	240.60m	.85m	3.50m
Dallas	137.6	1.58/1.66	2.67	2.62	.537	.955	4.3825	9.725	.....	.....	1.17	2.82
Denver	148.2	1.79/1.73	2.67	2.68	.48n	.87n	3.73n	.....	.....	.....	.75m	2.75m
Detroit	142.1	1.58/1.66	2.43	2.54	.90n	1.70n	6.80n	18.50n	164.80m	254.20m	1.10	4.05
Kansas City	138.5	1.60/1.66	2.43	2.62	.61	1.105	5.215b	11.08	275.00	485.00	.95	2.90
Los Angeles	148.6	1.65/1.73	2.35	2.54	.74bl	1.61bl	6.42bl	15.36bl	370.00l	530.00l	1.12	3.32f
Minneapolis	149.9	1.60/1.68	2.55	2.62	.86mo	1.55mo	6.70mo	.....	.....	.....	2.13h	5.74h
Montreal	133.3	1.56/1.64	2.55	2.62	1.13u	2.00u	7.50u	13.50u	288.00	545.00	1.17h	3.11j
New Orleans	.....	.....	.....	.....	.528	.963	5.10	.....	210.50p	468.00	.85	2.90
New York	138.7	1.58/1.66	2.35	2.54	1.02	1.94	7.56	19.48	.....	.....	1.50	3.00
Philadelphia	138.0	1.56/1.64	2.35	2.54	.68	1.31	5.13r	14.25r	300.00‡	350.00‡	1.75h	4.20h
Pittsburgh	142.9	1.58/1.66	2.35	2.54	.595m	1.15m	4.73m	12.40m	190.00	295.00	1.66z	3.93z
St. Louis	136.9	1.56/1.64	2.43	2.62	.59	1.08	4.45	10.80	180.00l	380.00l	1.45il	3.10hl
San Francisco	148.6	1.65/1.73	2.35	2.54	.78d	1.69d	6.72d	16.36d	320.00l	560.00l	1.05m	3.30m
Seattle	149.0	1.65/1.73	2.35	2.54	.67b	1.33b	6.84	.....	220.00c	.....	1.95by	4.75by
Toronto	.....	.....	.....	.....	.80	1.50	6.00	.....	157.00	280.00	.92	3.21

*WROUGHT STEEL PIPE (Full standard weight) Discount from list; see footnote

Mill	3½ to 6 in. Lap Weld‡‡ Galv. %	3½ to 6 in. Lap Weld‡‡ Black %	2½ & 3 in. Butt Weld‡‡ Galv. %	2½ & 3 in. Butt Weld‡‡ Black %
Lorain, Ohio	+8.00a	6.26a	0.50	0.50
Albquippa, Pa.	.....	.....	3.00	0.50
Sparrows Pt., Md.	.....	.....	1.50	0.50
Benwood, W. Va.	.....	6.25	16.75	16.75
Youngstown, O.	+10.50a	6.25	0.50	0.50
Indiana Harbor, Ind.	+11.50a	5.25ab	3.00	3.00
Sharon, Pa.	+10.50a	6.25	16.75	16.75
Wheatland, Pa.	+9.75d	4.50d	0.50	0.50
Etna, Pa.	+24.00ab	+7.25ab	3.00	3.00
Fontana, Calif.			+18.00	3.25

‡Continuous weld. †Production discontinued

*†† Extra quality *‡‡ delivered. *a PRICE INDEXES for CENTRIFUGAL CAST IRON PIPE (Include carload freight allowed to city). These also serve as the HISTORICAL RECORD of THE $ PER NET TON PRICE of CLASS B, B&S, PIT CAST IRON PIPE. F.O.B. Foundry Price Indexes Birmingham, Ala., 125.8; Burlington, N. J., 134.6. *b Extra strength. *c 4-in., $130. *d SS361-A *f 21 in. *g culvert pipe; reinf., ASTM C 75-56 *h reinf., ASTM C 75-54 *i reinf., ASTM C 76-55 *j centrispun; no standard specs. in Canada. *k 2% cash *l fob plant *m truck del. *n LCL del., fob truck *o listed price based on LCL (no min.) *p freight allowed to destination in city *q ASTM C 13-40 *r CL fob origin, freight allowed *s 1 ft lengths *t 3 ft lengths *u CESA A 60-1941 *v standard strength *w SS; add 20% for d.s. *x fob city *y Reinforced

* WROUGHT STEEL PIPE: Deduct discounts shown above from the following standard list consumers carload prices to get mill price. List prices per ft.(*based on approx. $200 per net ton): Butt Weld ⅛ in., 8¢; ¼ in., 8¢; ⅜ in., 8¢; ½ in., 8½¢; ¾ in., 11½¢; 1 in., 17¢; 1¼ in., 23¢; 1½ in., 27½¢; 2 in., 37¢; 2½ in., 58½¢; 3 in., 76½¢. Lap Weld 3½ in., 92¢; 4 in., $1.09; 5 in., $1.48; 6 in., $1.92. Add freight, 3% transport tax for destination price. † Production discontinued November 1957

WROUGHT IRON PIPE: List prices per ft. same as for wrought steelpipe, but add following "discounts" to get Pittsburgh mill price: Butt Weld—1 in. black, + 66.54, galv., + 95.77; 1¼ in. black, + 65.54, galv. + 95.23, 1½ in. black, + 61.78 galv. + 91.22; Lap Weld —2½ in. to 3 in. black + 67.95 galv. + 95.77; 4½ in. to 6 in. black + 64.74 galv. + 90.68 Add freight rates plus 3% transportation tax to get destination price.

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Steeltex easily spans six-foot centers on the fifth and sixth floor addition to Henry Ford Hospital in Detroit where it is supported by temporary shoring during pouring and curing. Bar mats provide reinforcing while Steeltex floor lath gives form to 3½ inch slab. Previously Steeltex was used on only 2- to 3-foot centers. The architect's decision to use Steeltex instead of wooden forms for six-foot spans was something new, but he soon saw it pay off as . . .

New use for Steeltex saves $26,000 at Henry Ford Hospital in Detroit

On Henry Ford Hospital's fifth and sixth floor addition, a new use for Steeltex floor lath piled up savings of approximately $26,000 on cost of materials and almost 50 percent on labor.

Architects for the $3½-million job approved Steeltex and bar mats to support 200,000 square feet of 3½ inch concrete slab set on six-foot centers by an ingenious method.

Previously, Steeltex wire mesh reinforcing—sold by Pittsburgh Steel Products Division of Pittsburgh Steel Company—had been used on centers two to three feet apart.

On jobs where the centers were farther apart, the architect usually specified a wooden forming material. Bar mats provided the reinforcing.

But Mike Sonk, Pittsburgh Steel Products Detroit district sales manager, had another idea.

He thought Steeltex could not only provide waterproofed forms less expensively for the Detroit hospital but help the bar mats make a stronger slab.

Sonk approached the architects with his idea. He pointed out Steeltex' cost saving advantages, speed of installation and ease of handling.

Whitacre Engineering of Canton, Ohio, contractors for the Steeltex-bar mat installation, also found out quickly how well Steeltex fills their needs.

The use of Steeltex brought a savings of approximately 50 percent.

Instead of spending many hours installing wooden forming material, laying bar mats and installing shoring, here's all Whitacre Engineering workmen installing the floors had to do:

Unroll lightweight Steeltex, cut it, tighten it, clip it and lay the bar mats —all in much less time.

The Steeltex-bar mat combination

Steeltex gives clean, neat appearance underneath slab after shoring is removed. Pittsburgh Steel Products Salesman Russ Nutter shows A. M. Downes, field engineer for sub-contractor, Whitacre Engineering, how easily ceiling hangers were placed through Steeltex paper, thereby eliminating costly drilling of individual holes when wooden forms are used. Architect: Albert Kahn Associated Architects and Engineers of Detroit.

also requires temporary shoring. But there's one big difference. Once shoring is removed, Steeltex is not dismantled as wooden forms are. Result? Better safety, better housekeeping, greater time savings.

Steeltex' speed of installation and easy handling really impressed Whitacre Foreman Mike Malett. He said:

"This is the first time I've seen Steeltex used primarily for its forming ability. I'm pleased with it.

"It certainly reduced forming costs. It took three men only one day to install 3,500 square feet of Steeltex on one of the floor sections.

"With wooden forms, it would have taken ten men two days."

"I also like the way Steeltex permits quick, easy installation of ceiling hangers," Mr. Malett added.

"All you do is stick the hangers through Steeltex paper so they protrude below where the ceiling is hung.

"With wooden forms we would have had to drill hundreds of holes for the hangers. That takes a lot of time and makes labor costs much higher."

A. M. Downes, field engineer for Whitacre Engineering, added: "I like the way Steeltex fits snugly around columns and pipes. It also cuts down drip-through of cement. Both advantages are a great help.

"What's more, our workmen can walk safely on Steeltex during installation and while concrete is being poured.

"Steeltex is ideal," Mr. Downes declared. "It gives reinforcing throughout, acts as a form and aids in curing the slab."

Steeltex' advantages can be put to work for you, too, on an application like that at Henry Ford Hospital. Or you might have one where centers are closer.

But no matter what the application, Steeltex is available to cut labor and material costs and insure stronger, more durable slabs.

Complete engineering advice is available at any of the Pittsburgh Steel Products Sales Offices listed here.

Call today . . . pocket the savings tomorrow.

▶ See Sweets Catalog Section 2-B

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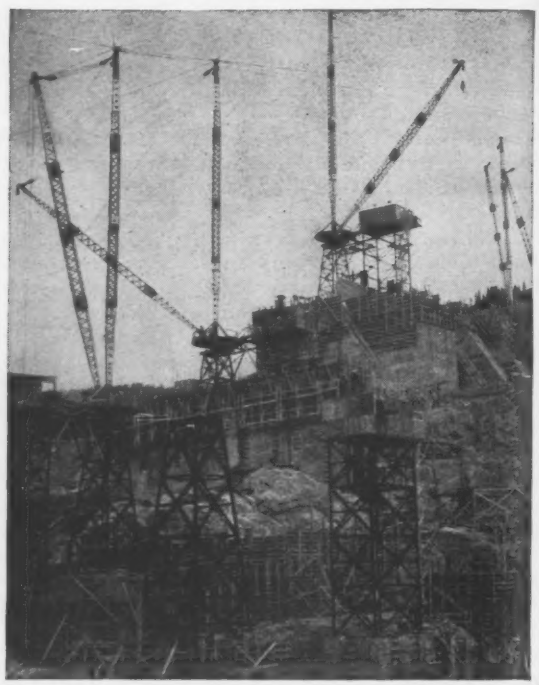
Art Fox, B.C.E., Manhattan College '47, reaches 77,000 engineers and construction men as a Senior Editor of McGraw-Hill's ENGINEERING NEWS-RECORD

An Editor with a Hard Hat. Art, pictured above at right with Assistant Resident Engineer McCormack, observes progress at the Beaumont Rapids power dam at St. Maurice River, Quebec.

In ten short years, Art has climbed rapidly in his profession. Just back from a 2,500-mile editorial trip to Canada, here's what he has to say:

"To me, journalism is a form of teaching. Backed by the world-wide resources of McGraw-Hill, through travel, by working with leading engineers, I report on what's new and significant in engineering and construction. I try to make my articles more than instructive—to inspire readers to tackle and solve projects they might otherwise shy away from."

Other than preparing reports in college, Art had no early writing experience. Immediately after graduation, he was employed by a leading firm of consulting engineers. While on the job his appreciation for the inspiration-power of the industrial magazine



Cranes and Concrete. Another view of the Beaumont Rapids project. Art drove 1,800 miles from Montreal to get three on-site stories. Like other McGraw-Hill editors he got his story *firsthand.*

an "Engineer-Journalist"

grew, and in less than a year he applied for a position with McGraw-Hill.

Art started with ENGINEERING NEWS-RECORD in 1948 as an Assistant Editor. Since then, Art has been "up to his neck in engineering" . . . earned his P. E. license while an engineer-journalist . . . been active in A.S.C.E. and other professional organizations.

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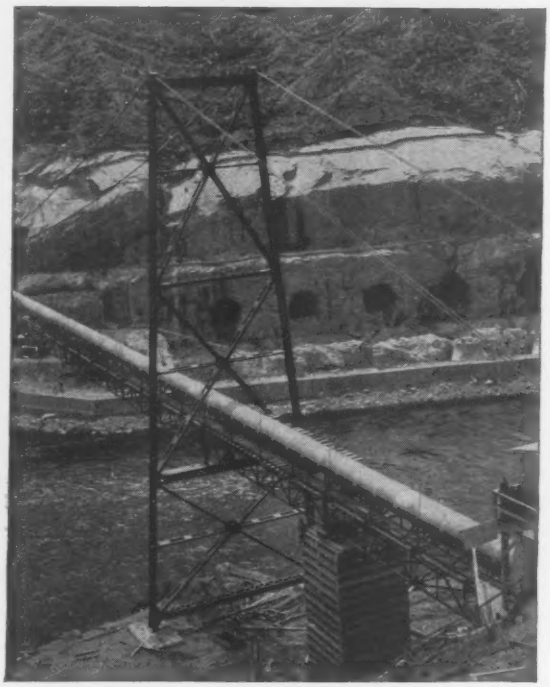
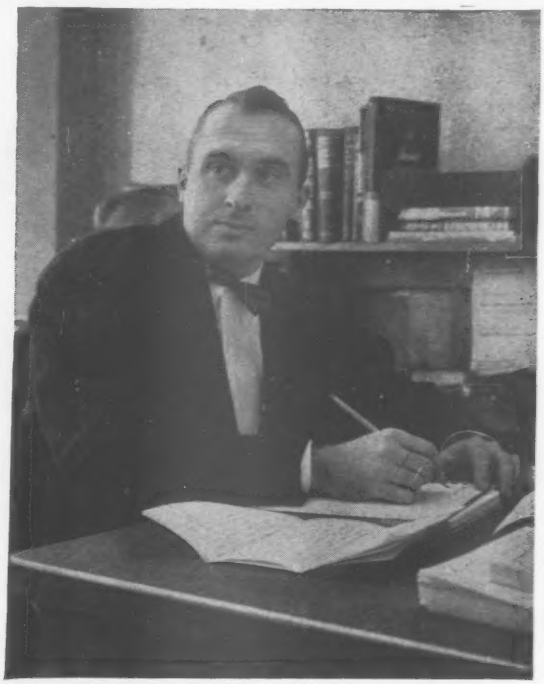


Dams and Tunnels. Here's a shot Art took of work on the Bersimis Powerhouse. As a McGraw-Hill engineer-journalist, you, too, will expand your professional background while reporting to your industry.



Desks and Plans. Here's Art at his desk in the McGraw-Hill Building. You, like Art, will travel, participate in professional societies and advance yourself financially and educationally—as well as serving your industry and profession.

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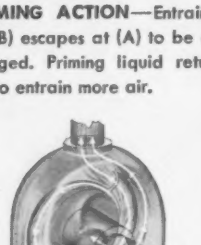

PUMPING ACTION—Straight-in suction voids entrance restrictions. Water enters direct to the eye of the impeller.

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J. A. MAHONEY, M. WETZEL, M. E. SCIORRA, D. TARTAGLIA, Reports
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

HEAVY CONSTRUCTION—BA

▲ **Massachusetts**—BAY IMPRVS.—BA 4/23—Commonwealth of Mass., Metropolitan Dist. Comn., Parks Div., 20 Somerset St., Boston, dam and hydraulic structures Pleasure Bay imprvs., Pleasure Bay, South Boston. $1,377,000. Plans deposit $10. Fay, Spofford & Thorndike, 11 Beacon St., Boston, Mass., engrs. CD 4/4/56.

† **R. I., Newport**—STEAM DISTR. SYS.—BA 4/25—Dist. P. Wks. Office, 1st Naval Dist., Bldg. 37, 495 Summer St., Boston, Mass., rehabilitation steam distr. sys. Naval Underwater Ordnance Station, NBy 16538, Spec. 16538/57. CD 4/15/55.

† **R. I., Quonset Point**—BUS DUCT—BA 4/25—Dist. P. Wks. Office, 1st Naval Dist., Bldg. 37, 495 Summer St., Boston, Mass., bus duct and receptacle sys. for power conversion units in Bldgs. Nos. 1, 2, 3 and 5, U. S. Naval Air Station, NBy 17495, Spec. 17495/58. CD 8/28/56.

† **Connecticut** — ATHLETIC FACILITIES — BA On Or About 4/29—U. S. Eng., 150 Causeway St., Boston 14, Mass., constr. of athletic facilities for Nike batteries in the Bridgeport and Hartford Defense Areas as follows:

(a) **Bridgeport Defense Area:**—(1) Nike Battery 04-control area, Ansonia, Connecticut. (2) Nike Battery 15-control area, Orange. (3) Nike Battery 17-launcher area, Milford. (4) Nike Battery 65-control area, Westport. (6) Nike Battery 94-launcher area, Shelton. Fairchild. (5) Nike battery 73-control area, Westport. (6) Nike Battery 94-launcher area, Shelton.

(b) **Hartford Defense Area:**—(1) Nike Battery 08-launcher area, East Windsor. (2) Nike Battery 25-control area, Manchester. (3) Nike Battery 36-launcher area, Portland. (4) Nike Battery 48-control area, Cromwell. (5) Nike Battery 57-group headquarters, New Britain. (6) Nike Battery 67-control area, Plainville. (7) Nike Battery 85-launcher area, Simsbury. ENG-19-016-58-142. CD 1/17 and 1/20.

† **Mass., Falmouth** — BOMARC MISSILE LAUNCHING SITE—BA 5/7—U. S. Eng., 150 Causeway St., Boston, BOMARC missile launching site, Otis Air Force Base, ENG-19-016-58-127. Over $100,000. Plans deposit $150. Anderson, Nichols & Co., 150 Causeway St., Boston, and Samuel Glaser & Assoc., 234 Clarendon St., Boston, archts. (joint venture). CD 4/1.

† **Massachusetts-Rhode Island**—SPECIAL AAA FACILITIES—BA On Or About 5/9—U. S. Eng., 150 Causeway St., Boston 14, Mass., addns., alterations for Special AAA facilities in the Providence Defense Area: (a) 19-control and launcher areas, Rehoboth, Mass.; (b) 29 Swansea, Mass., control area and Dighton, Mass. launcher area; (c) 38-control and launcher areas, Bristol; (d) 58-control and launcher areas, North Kinstown; (e) 69-control and launcher areas, Coventry; (f) 79-control and launcher areas, Foster; (g) 99-control and launcher areas, North Smithfield, ENG-19-016-58-141.

▲† **Me., Presque Isle**—MISSILE FACILITY—BA On Or About 5/14—U. S. Eng., 150 Causeway St., Boston, Mass., Missile Facility (1) six assembly and checkout bldgs. (2) power and water pumping plants (3) engine run up bldg. (4) surveillance and inspection bldg. (5) rehabilitation of existing administration and control bldg. (6) control and identification bldg. (7) six compressor houses (8) igniter checkout bldg. (9) fuel oil tank farm (10) twelve launch pads (11) water distr. sys., incl. fire hydrants (12) sanitary sewerage sys. (13) outside communications and power distr. (14) site preparation (15) road network, incl. b. conc. primary, secondary and third class roads and parking areas, ENG-19-016-58-132. Over $10,000,000. Plans deposit $50. CD 1/10.

BUILDINGS—BA

▲ **Mass., Everett**—HOSPITAL—BA 5/2—Whidden Memorial Hospital, 780 Broadway, hospital nursing wing addn., Garland St. $1,000,000. Plans deposit $50. Extended date. Valtz & Kimberley, Inc., 820 Lynn Fells Parkway, Melrose, Mass., archt. CD 4/1.

HEAVY CONSTRUCTION—LB & CA

MASSACHUSETTS—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston, Bids opened 4/1,

Henley-Londgren Co., 93 Hartford Pike, Shrewsbury, Mass. LB $549,867, est. $805,570, relocate section Rte. 29, Brimfield and Sturbridge. CD 3/20.

† **New England Dredge & Dock Co.**, 60 South Water St., New Haven, Conn. LB $103,275, est. $76,650, dredging channel entrance, Bass River, Yarmouth and Dennis, MASSACHUSETTS. Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston, Mass. Walter E. Rowley, West Wareham, Mass., engr. Bids Apr. 1. CD 3/25.

† **Massachusetts Northern Constr. Corp.**, 1 Mill St., Lawrence, Mass. CA $682,483, est. $783,428, constr. dam, etc. Quinebaug River, East Brimfield, CIVENG-19-016-58-49, MASSACHUSETTS. U. S. Eng., 150 Causeway St., Boston, Mass. Bids Mar. 12. CD 3/19, under LB.

Charles Constr. Co., 192 Merrimack St., Methuen, Mass. LB (B) $172,591 (C) $133,912, est. $300,000, apron, taxiways, terminal, etc., Proj. 9-19-007-04, NORTH ANDOVER, MASS. City, Airport Comn., City Hall, Lawrence, Mass. Bids Mar. 31. CD 3/4.

▲ **RHODE ISLAND**—State R. I .& Prov. Plants, Providence, Bids opened 4/2,

Campanella & Cardi Constr. Co. 780 Jefferson Blvd., Warwick, R. I. LB $1,473,571 Bid 785, R. I. Contr. No. 5805F.A. Proj. No. 1-01 (18) Hy West Warwick East Greenwich and West Greenwich, paving 7 mi. relocation Rte. 3, Kent Co. CD 3/21.

† **U. S. Eng.**, 150 Causeway St., Boston, Mass. rejected bids Feb. 20 for addns., alterations Special AAA Facilities, Defense Area NIKE Batteries 19-29, Mass-38-58-69 79 and 99 ENG-19-016-58-61, RHODE ISLAND. LB $253,835. Will re-advertise. CD 3/3, under LB.

BUILDINGS—LB & CA

† **A. P. Wyman, Inc.**, 240 College Ave., Waterville, Me. LB $191,990, est. $230,000, combined field MAINTENANCE SHOP, Camp Keyes. 17-018-58-3, AUGUSTA, ME. State, Office Property & Disbursing Officer, Adjutant's General, Camp Keyes, Augusta. Bids Apr. 1. CD 3/11.

▲ **Franchi Constr. Co., Inc.**, 216 Webster St., West Newton, Mass. LB $2,327,408, constr. 1 story, mezzanine part 6 story bldg. approx. 134,580 sq. ft. floor area, etc. U. S. POST OFFICE and COURTHOUSE (lease-purchase proj.) Elmwood Ave., Pearl St. and George St. BURLINGTON, VT. General Services Admin. Pub. Bldg. Service, F St. between 18th and 19th Sts. N.W., Wash. 25, D. C. Bids Apr. 4. CD 4/1.

P. F. **Beresford**, 269 Spring St., Medford, Mass. CA Est. $500,000, STUDENT UNION BLDGS., POWERHOUSE and GARAGE, NORTH ANDOVER, MASS. Merrimack College, North Andover, Mass. Bids Mar. 27. CD 3/12.

St. **Francis Xavier, Roman Catholic Parish**, Chancery Office, 1 Lake St., Brighton, Mass., cancelled bids to have been opened Apr. 2, SCHOOL and HALL, Pleasant St., SOUTH WEYMOUTH, MASS. $500,000. CD 3/19.

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $73,000; industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England
Middle Atlantic
South
Middle West
West of Mississippi
Far West

PROPOSED WORK

Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Public Buildings
Mass Housing
Commercial Buildings
Industrial Buildings
Unclassified

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.
SOON LETS CONTRACT: SLC
LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.
CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.
CD dates shown are of Construction Daily Issue in which last previous report was published.
OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

† **Federal Government**
▲ **Project of $1,000,000 or over.**
ENR **Engineering News-Record**
CD **Construction Daily**

For additional reports see Construction Daily.

† **Samuel Glazer & Son**, 2-8 Winchester St., Brookline, Mass. LB $427,795, est. $400,000-$500,000, N.E.D. HEADQUARTERS relocation, 424 Trapelo Rd. (Murphy Hospital), CIVENG-19-016-58-58, WALTHAM, MASS. U. S. Eng., 150 Causeway St., Boston, Mass. Bids Apr. 1. CD 3/20.

J. & H. Electric Co., 200 Richmond St., Providence, R. I. LB $103,975, est. $100,000 Bid 735, Proj. WEL-3 exten. to existing POWER PLANT at State Hospital, HOWARD R. I. State R. I. & Prov. Plants, Div. Purchase State House, Providence, R. I. Bids Mar. 31. CD 3/27.

Campanella & Cardi Constr. Co., 780 Jefferson Blvd., Warwick, R. I. LB $119,596, est. $125,000 bit. macadam paving sundry streets, PROVIDENCE, R. I. City Clerk's Office, City Hall, Providence, R. I.

▲ **George & Mary Conlon**, 41 Courtland St., Pawcatuck, Conn., Owner Builds $1,500,000, 150 HOUSES "Laurelwood" Poquonock Road 1 Rd., GROTON, CONN.

Chicago Bridge & Iron Co., 1305 W. 105th St., Chicago, Ill., CA Approx. $125,000, constr. Hortonsphere Gas Oval Tank, on footings, 82 ft. in diam., 1,000,000 cu. ft. capacity, Vernon Traffic Circle, VERNON, CONN. Connecticut Light & Power Co., P. O. Box 2010, Hartford 1, Conn. CD 3/14.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

N. J., Hackensack—MAINTENANCE—BA 4/21—Bergen County Park Comn., Admin. Bldg., maintenance bldg. at Rockleigh Bergen County Golf Course. Plans deposit $25.

Md., Wheaton—BANK—BA 4/22—Suburban Trust Co., 6495 New Hampshire Ave., Hyattsville, bank at University Blvd. West and Grand View Aves. Plans deposit $50. A. L. Anderson, 1726 L St. N.W., Wash., D. C., archts.

Pa., Phila.—BA 4/22—Dpt. Procurement, City Hall Annex, Bid 2011, Contr. No. 845-W, water main in Pennypack St., Bid 2012 Contr. 880-W, constr. express water main from Queen Lane H. S. pump station to Roxborough filters, Bid 2031 Contr. 1242, cleaning and asph. coating c.i. water mains in various sections of city. CD 3/11/46.

† **D. C., Wash.**—STORAGE—BA 4/23—Dist. P. Wks. Office, Potomac River Naval Command, Naval Gun Factory, Wash., storage bldg. at Naval Security Station, NBy 12957. CD 4/1.

† **Pennsylvania**—PARK IMPRVS.—BA 4/23—General State Auth., 18th and Herr Sts., Harrisburg, repairs to 2 access bridges at Shawnee State Park. Gannett, Fleming, Corddry & Carpenter, Inc., Harrisburg, engr. CD 10/17/56.

▲† **Pa., Middletown**—POWER PLANT SHOP—BA 4/24—U. S. Eng., 24th St. and Maryland Ave., Baltimore 18, Md., 1 story aircraft power plant shop, Olmsted Air Force Base, ENG-18-020-58-12. $1,000,000-$3,000,000. J. Fruchtbaum, 1965 Sheridan Dr., Buffalo 23, N. Y. engr. CD 9/17.

N. Y., New York—LIGHTING—BA 4/25—New York City Transit Auth., 370 Jay St., Brooklyn, Zone 1, installing fluorescent lighting for Station Platforms, 50, 59, 66, 79 and 86 St. Stations, Broadway-Seventh Ave. Line IRT Div., Contr. E-156, Manhattan Boro. CD 8/31/45.

† **Pa., Middletown**—REPAIR SHOP—BA 4/29—U. S. Eng., 24th St. and Maryland Ave., Baltimore 18, Md., 1 story, concrete masonry, electronics and magnetic instrument repair shop, ENG-18-020-58-13. $100,000-$500,000. J. Fruchtbaum 1965 Sheridan Dr., Buffalo 23, N. Y., engr. CD 9/17.

▲† **Pa., Middletown**—DEPOT OPERATIONS BLDG.—BA 4/30—U. S. Eng., 24th St. and Maryland Ave., Baltimore 18, Md., 3 story, rein.-con. depot operations bldg., Olmsted Air Force Base, ENG-18-020-58-14. $1,000,000-$3,000,000. Lawrie & Green, 321 N. Front St., Harrisburg, archts.-engrs. CD 3/19.

BUILDINGS—BA

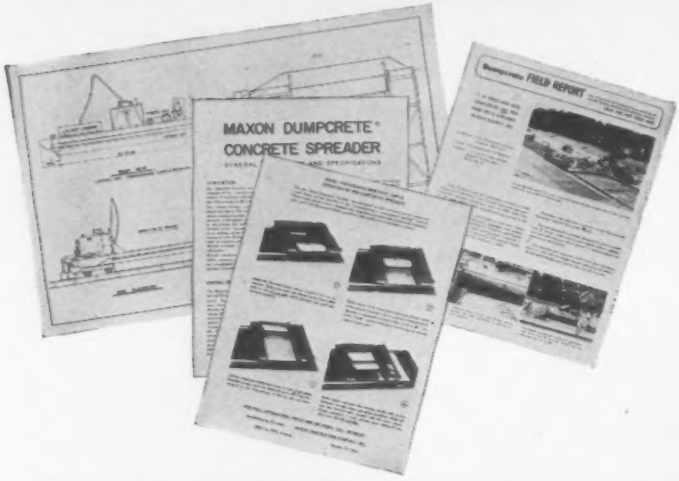
Pennsylvania—BA 4/30—General State Auth., 18th and Herr St., Harrisburg, imprvs. to camp area at Promised Land State Park, Pike Co. $200,000 Plans deposit $10. Extended date. L. R. Kimball, 100 S. Center St., Ebensburg, engr. CD 3/26.

† **Pa., Corapolis**—ADMINISTRATION BLDG. ADDN.—BA 5/2—Contracting Officer, Dpt. Army & Air Force, National Guard Bureau, U. S. Property & Fiscal Office for Pa., R.D. No. 2, Annville, addn. to administration bldg. for utilization as food service kitchen, Greater Pittsburgh Airport. Plans deposit $5. CD 7/1, under LB.

▲ **N. J., Kearny**—SCHOOL—BA 5/5—Bd. Educ., Town Hall, elementary school, Davis Ave. $3,400,000, Robert Fava, 11 Hill St., Newark, archt. CD 6/21.

▲ **Pa., Polk**—KITCHEN, DINING ROOM FACILITIES—BA 5/7—General State Auth., 18th and Herr Sts., Harrisburg, kitchen and dining room facilities at Polk State School. $1,000,000. Plans deposit $15. Trefry Engineers, Box 230, Butler, engrs. CD 12/31/56.

NEW LITERATURE FOR YOU!



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† **Pa., Wilkes-Barre** — CHAPEL — BA 5/13 — Veterans Admin., Munitions Bldg., Wash., D. C., Chapel Bldg. 21 at Veterans Admin. Hospital. Eyerman & Hoban, 54 Public Square, archts. CD 10/29.

† **N. Y., Corning**—TRAINING CENTER—BA 5/14—U. S. Eng., 111 E. 16 St., New York, Zone 3, training center, Serial No. ENG-30-075-58-251. $150,000-$175,000. Plans deposit $25. CD 12/28/56.

† **N. Y., Wayland**—TRAINING CENTER—BA 5/14—U. S. Eng., 111 E. 16 St., New York, Zone 3, training center, Serial No. ENG-30-075-58-252. $150,-000-$175,000. Plans deposit $25. CD 4/29.

BUILDINGS—SLC

Pa., Connellsville—WAREHOUSE—Anchor Hocking Glass Co., Connellsville, soon lets contract, 1 story metal siding steel frame warehouse. $325,000.

HEAVY CONSTRUCTION—LB & CA

Brown Boveri Corp., 19 Rector St., New York, N. Y., LB $987,000, NP-7, 4 transformers for Niagara Project, NEW YORK. Power Authority of State of New York, The Coliseum Tower, 10 Columbus Circle, New York 19, N. Y. Bids Apr. 3. CD 8/15.

† **R. and I. E. Equipment Div., I. T. E. Circuit Breaker Co.**, Greensburg, Pa., CA $974,000, Contr. NP-6, furnishing misc. electrical equip. for Lewiston Power Plant of Niagara Power Proj., incl. 13 sets of 15-kilovolt insulated phase bus conductors, NEW YORK. Power Auth. of State of New York, The Coliseum Tower, 10 Columbus Circle, New York 19, N. Y. Bids Mar. 27. CD 3/31, under LB.

▲ **W. J. Irwin & Son**, Irwin Rd., Tonawanda, N. Y., CA $1,267,491, moving houses, constructing park and playground, NP-9, Niagara Power Project, NEW YORK. Power Authority of State of New York, The Coliseum Tower, 10 Columbus Circle, New York 19, N. Y. Bids Mar. 24. CD 8/15.

† **Henry Dubuis Sons Co., Inc.**, 19 Rector St., New York 7, N. Y., LB $118,041 (1 bidder) dredging to depths 18 and 16 ft. below mean low water involving removal approx. 51,100 cu. yd. place measurement of all material except ledge rock from East Branch, Newtown Creek, Kings and Queens Counties, Serial No. CIVENG-30-075-58-50, NEW YORK. U. S. Eng., 111 E. 16 St., New York 3, N. Y. Bids Apr. 3. CD 3/14.

▲ **Atlantic Gulf & Pacific Co.**, 15 Park Row, New York 38, N. Y., CA Est. $1,200,000, dredging 4,000,000 cu. yd. material for fill for new runway at New York International Airport, IDLEWILD, N. Y. Port of New York Auth., 111 Eighth Ave., New York 11, N. Y. CD 2/25/53.

▲ **Atlantic Gulf & Pacific Co.**, 15 Park Row, New York 38, N. Y., CA $4,872,000, dredging 14,000,000 cu. yd. material to create new Elizabeth channel, ELIZABETH, N. J. Port of New York Auth., 111 8 Ave., New York 11, N. Y. Bids Mar. 17. CD 12/6/55.

Penn-Jersey Contractors, Inc., 1100 S. Broad St., Trenton, N. J., LB $97,263, (10 bidders), laying 9,500 ft. 12 in. water mains in Lower Ferry and Upper Ferry Rds., Ewing Twp., TRENTON, N. J. Twp. of Ewing, Municipal Bldg., Pennington Rd., Trenton, N. J. Lewis W. Klockner, Municipal Bldg., Pennington Rd., Trenton, N. J., engr.

▲ **PENNSYLVANIA**—Pa. Hy. & Bridge Auth., 506 North Office Bldg., Harrisburg,
Central Pa. Quarry Stripping & Constr. Co., Hazleton, Pa. CA $1,900,258 constr. 28,450 ft. rein.-con. pavement 48 ft. wide with 2 ft. separator U.S. 30 (E. Providence and W. Providence Twps.) Proj. 709-1, Bedford Co. Bids Mar. 14. CD 3/19, under LB.

▲ **PENNSYLVANIA**—State Hy. & Bridge Auth., 506 North Office Bldg., Harrisburg,
Latrobe Road Constr., Inc., Box 150, Latrobe, Pa. CA $1,294,424 constr. 23,635 ft. rein.-con. variable in width R.T. 66 Proj. 705-1 Salem and Washington Twps., New Salem Boro, Westmoreland Co. Bids Mar. 14. CD 3/19, under LB.

Pa. Dpt. Property & Supplies, Box 382, Harrisburg, Pa., cancelled bids to have been opened Apr. 2, renew exterior water service piping and piping to fire hydrants at Capitol Bldg. HARRISBURG, PA. Est. $110,000. CD 3/21.

BUILDINGS—LB & CA

† **U. S. Eng.**, 111 E. 16 St., New York 1, N. Y., cancelled bids to have been opened Apr. 4, 66 units of Capehart HOUSING, Serial No. ENG-30-075-58-190, FORT WADSWORTH, N. Y. CD 3/7.

Donald Stein & Robert Bernhard, 1 Grace Court North, Great Neck, N. Y., Owner Builds, $350,000, 20 HOUSES, Anchorage Woods, 4th Ave., PORT WASHINGTON, N. Y. (Correction-owners' name). CD 4/1.

▲ **Montgomery Constr. Co. & Assocs.**, 803 W. Plain St., Grove City, Pa. CA $1,161,772 constr. SECONDARY SCHOOL BLDG. for Northern Butler County Jt. School Bd., Cherry Twp., PARKER, PA. Pa. Pub. School Bldg. Auth., 101 S. 25th St., Harrisburg, Pa. Bids Mar. 4. CD 3/7, under LB.

The Builders Co., 5405 Market St., Youngstown, O. CA $784,369 constr. SECONDARY SCHOOL BLDG. for Sharpsville Jt. School Bd., SHARPSVILLE, PA. Pub. School Bldg. Auth., 101 S. 25th St., Harrisburg, Pa. Bids Feb. 18. CD 2/27, under LB.

▲ **Charles E. Brohawn & Sons**, 21 Poplar St., Cambridge, Md., LB $1,056,044 (4 bidders) Base Bid, HIGH SCHOOL, near DENTON, MD. Caroline County Bd. Educ., Denton, Md. Bids Apr. 2. CD 3/10.

▲† **Irons & Reynolds Co., Inc.**, 1724 H St. N.W., Wash., D. C., CA $2,828,000, AUDITORIUM and FINE ARTS BLDG. (except elevators), Howard University,

WASH., D. C. General Service Admin., Public Bldg., Service Room 1304, 19th and F Sts. N.W., Wash., D. C. Bids Feb. 25, awarded Apr. 4. CD 2/28, under LB.

SOUTH

HEAVY CONSTRUCTION—BA

† **Fla., Jacksonville**—NAVAL AIR STATION IMPRVS.—BA 4/23—Officer in Chge. of Contr., Bldg. 902, Naval Air Station, installation of 2,500 KVA transformers Power Plant No. 2, remove present transformers, install two 2500 KVA trans. (15 ton each) ducts, cables, wiring, Naval Air Station, NBy 17273, Spec. 17273/58. CD 8/27/56.

† **Fla., Eglin Air Force Base**—AIR BASE IMPRVS.—BA 4/24—U. S. Eng., 2301 Grant St., Mobile, Ala., 2 story, 42 x 291 ft. masonry exterior walls, officers' quarters, ENG-01-076-58-75. CD 3/20.

† **Fla., Key West**—AIR STATION IMPRVS.—BA 4/24—Dist. P. Wks. Office, Sixth Naval Dist., Bldg. No. 13, U. S. Naval Base, Charleston, S. C., replacement of runway and taxiway lighting cable, Naval Air Station, Boca Chica Field, NBy 17365, Spec. 17365/58. CD 9/18.

† **Fla., Panama City**—AIRPORT IMPRVS.—BA 4/24—U. S. Eng., 2301 Grant St., Mobile 7, Ala., constr. Officers' quarters at Tyndall Air Force Base, ENG-01-076-58-77. CD 3/27.

† **Fla., Sanford**—NAVAL AIR STATION IMPRVS.—BA 4/24—Dist. P. Wks. Office, Sixth Naval Station, Bldg. No. 13, U. S. Naval Base, Charleston, S. C., repairs to Wood Hangar, Bldg. No. 4, U. S. Naval Station, NBy 16639, Spec. 16639/58. CD 8/27/56.

† **Va., Chincoteague**—FIRE ALARM SYS.—BA 4/24—Dist. P. Wks. Office, 5th Naval Dist., Room 207, Bldg. N-26, U. S. Naval Base Norfolk, rehabilitation fire alarm sys. Naval Air Station and Naval Aviation Ordnance Test Station, NBy 15198, Spec. 15198/57. CD 9/17.

† **Ala., Montgomery**—AIRMEN'S DORMITORY—BA On Or About 4/25—U. S. Eng., 2301 Grant St., Mobile, constr. airmen's dormitory at Gunter Air Force Base, ENG-01-076-58-81. CD 11/20/52.

† **Fla., Jacksonville**—NAVAL AIR STATION IMPRVS.—BA 4/28—Resident Officer in Charge of Constr., Bldg. 902, Naval Air Station, modify cleaning, shop, rearrange monorail system, new tanks, ventilation, drainage electr. Govt. to furnish tanks, Naval Air Station, NBy 16650, Spec. 16650/58. CD 8/27/56.

† **Fla., Jacksonville**—NAVAL AIR STATION IMPRVS.—BA 4/28—Resident Officer in Charge of Constr., Bldg. 902, Naval Air Station, air craft paint spraying facility, Bldg. No. 122, NBy 17333, Spec. 17333/58. CD 8/27/56.

† **Fla., Cross City**—OPERATION FACILITIES—BA 4/30—U. S. Eng., P. O. Box 4970, Jacksonville, Fla., foundations and erection of Towers AC & W facilities three 50 ft. steel towers, 2 temperate and 1 Artic on concrete fdns. supported by timber piling, ENG-08-123-58-40. CD 4/3.

† **Fla., Eglin Air Force Base**—AIRPORT IMPRVS.—BA 5/1—Office of Assistant for Procurement Headquarters, Bldg. 358, Air Proving Ground Center, Eglin Air Force Base, Eglin Gulf Test Range area, IV Anclote Pasco County, approx. 3 mi. north of Tarpon Springs. CD 4/4.

† **N. C., Fort Bragg**—AIR BASE IMPRVS.—BA 5/6—U. S. Eng., 308 Custom House, Wilmington, repairs to Tank Creek extension, Pope Air Force Base, ENG-31-075-58-40. CD 8/27/56.

† **N. C., Goldsboro**—AIR BASE IMPRVS.—BA On Or About 5/13—U. S. Eng., 308 Customhouse, Wilmington, outfall ditch, Seymour-Johnson Air Force Base, ENG-31-075-58-38. CD 9/17.

† **Kentucky**—BA 5/15—U. S. Eng., P.O. Box 2127, Huntington 18, W. Va., constr. dam, guard walls and lock emergency gates for Greenup Locks and Dam, Ohio River, at Greenup, Serial No. CIVENG-46-022-58-45. CD 4/1.

† **Fla., Jacksonville**—NAVAL AIR STATION IMPRVS.—BA 5/20—Dist. P. Wks. Office, Sixth Naval Dist., Bldg. No. 13, U. S. Naval Base, Charleston, S. C., ammunition storage facilities, U. S. Naval Air Station, NBy 10404, Spec. 10404/57. CD 8/27/56.

† **Fla., Sanford**—NAVAL AIR STATION IMPRVS.—BA 5/20—Dist. P. Wks. Office, Sixth Naval Dist., Bldg. No. 13, U. S. Naval Base, Charleston, S. C., extension to Runway 9-27, U. S. Naval Air Station, NBy 13610, Spec. 13610/57. CD 8/27/56.

▲† **Florida**—AMMUNITION STORAGE—BA 5/21—Dist. P. Wks. Office, Sixth Naval Dist., Bldg. No. 13, U. S. Naval Base, Charleston, S. C., ammunition storage facility, U. S. Naval Magazine, Yellow Water, NBy 13953, Spec. 13953/57. Over $1,000,000. CD 10/21.

BUILDINGS—BA

N. C., High Point—SCHOOL—BA 4/23—City Bd. Educ., City Hall, 86,339 sq. ft. Northeast Junior High School. Plans deposit $50, genl. contr. $25, each other. McMinn, Norfleet & Wicker, 2828 Lawndale Dr., Greensboro, archts.

† **S. C., Charleston**—BOILER PLANT—BA 4/29—Dist. P. Wks. Office, Bldg. No. 13, U. S. Naval Base, Charleston, new boiler plant for subsistence bldg. U. S. Naval Hospital, NBy 17354, Spec. 17354/58. CD 9/17/51.

† **S. C., Charleston**—DISTRICT CHAPLAIN'S OFFICE—BA 4/29—Dist. P. Wks. Office, Bldg. No. 13, U. S. Naval Base, Charleston, altering District Chaplain's Office Bldg. No. 76, U. S. Naval Base, NBy 17353, Spec. 17353/58. CD 9/17/51.

† **Virginia**—BA 5/6—HEADQUARTERS SQUADRON BLDG.—BA 5/6—At office Dist. Engr., 1st and Douglas Sts. N. W., Wash. 25, D. C., headquarters squadron bldg. and laboratory located in Fairfax Co. approx. 3 mi. south of Alexandria at intersection of Telegraph Rd. and Kings Hy., ENG-49-080-58-40 (39). Plans deposit $50. CD 3/20.

▲ **Fla., Miami**—HOTEL—Bids Asked—Skyways Hotel Corp., Warren Freeman, pres. and gen. mgr., 336 Biscayne Bldg., Hotel "Starways" LeJeune Rd. and NW 18th St. $4,000,000. Rader & Assocs., 111 NE 2nd Ave., archts. CD 7/31.

HEAVY CONSTRUCTION—LB & CA

NORTH CAROLINA—State Hy. Dpt., Raleigh, **C. C. Mangum, Inc.**, 3010 Hillsboro St., Raleigh, N. C., CA **$886,558**, est. $500,000, grading, structures 11.63 mi. addnl. lane on U S 70 between N. C. 54 and Efland, Proj. 8/16014 10644 (17), Alamance-Orange Cos. Bids Mar. 25 Awarded Apr. 2, CD 3/31, under LB.

O. K. Thorrington & Sons, Henderson, N. C., LB **$107,690**, water treatment plant addn., WARRENTON, N. C. Town, Town Hall, Warrenton, N. C. Bids Mar. 14. CD 2/28.

▲ **Farnsworth & Chambers, Inc.**, 3601 Brock, Houston, Tex. and **Guy H. James Constr. Co.**, 4901 N. Sewell, Oklahoma City, Okla., CA **$8,000,000** (12 bidders) Lewis Smith Dam, incl. main dam, concrete power house, tunnels, etc., on Warrior River, Walker-Cullman Counties, ALABAMA. Alabama Power Co., Ala. Power Bldg., Birmingham, Ala. CD 9/8/54.

Hebert Bros., Box 4848, Plaquemine, La., CA **$271,615**, Contr. 3, water dist. sys., pump control house, elevated tank foundations, gas distr. sys. addns., renovations, GONZALES, LA. Town and Sewer Dist. 1, Gonzales, La. Bids Mar. 13. CD 3/24, under LB, Sewers.

▲† **T. L. James**, Ruston, La., CA **$1,430,295**, runway, airfield paving, blast protection pavement, utilities, etc., modification drainage sys. and existing runway and approach lighting sys., Barksdale Air Force Base, ENG-03-050-58-25, SHREVEPORT, LA. U. S. Eng., 300 Broadway, Little Rock, Ark. Bids Mar. 19. CD 3/24, under LB.

BUILDINGS—LB & CA

▲ **J. W. Bateson**, Gibraltar Life Bldg., Dallas, Tex., CA **$2,635,725**, FEDERAL OFFICE BLDG., (lease-purchase), HUNTINGTON, W. VA., General Services Admin., 19th and F Sts., N.W., Wash., D. C., Bids Mar. 7. CD 3/12, under LB.

(Continued on page 154)

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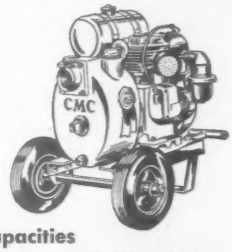
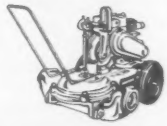


Capacities
4,000 to 240,000 GPH

2", 3" & 4"
DIAPHRAGMS



2", 3", 4", 5" & 6"
HI-PRESSURE Pumps

PUMPS

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BATCH-A-BOUT... biggesno

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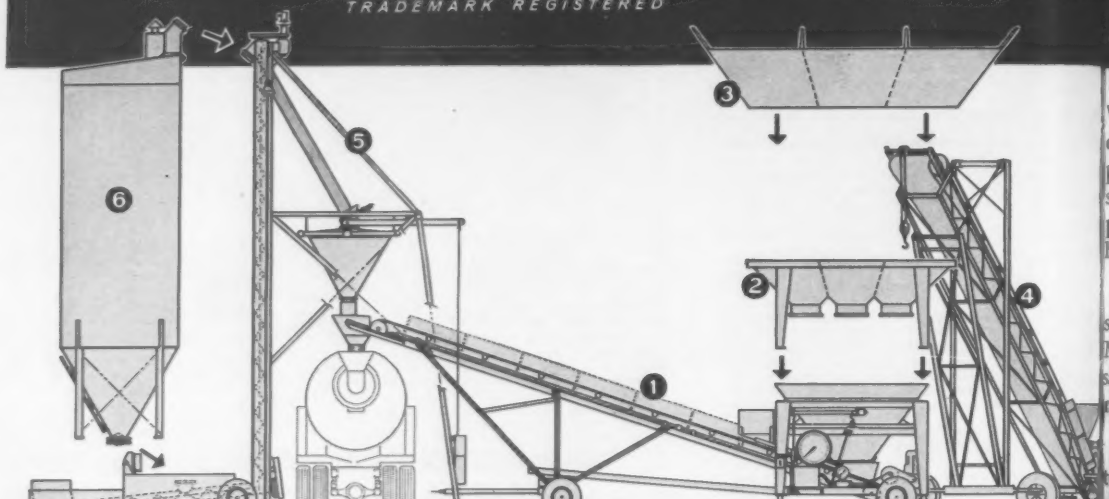
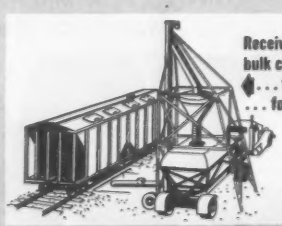


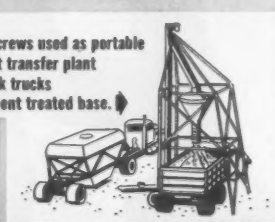
Your investment in a **BATCH-A-BOUT** can be as modest as you care to make it. With the basic components... the aggregate weigh batcher, batch transfer conveyor and sack cement loading hopper ... you can enlarge the plant later to suit bigger jobs as your needs grow. In a step-by-step enlargement of the plant, you can add the 12 ton capacity overhead aggregate bin-gate section which is still low enough for scoop loading and highway transport ; bin top extension complete with heap plates to 40 tons storage ; portable aggregate bin loading conveyor ; bulk cement receiving and elevating screw with automatic batcher and compressor ; 1000 cu. ft. cement silo

Plant output varying from 30 to 60 cubic yards per hour easily attained depending on equipment used.

Aggregate bin loading conveyor as a portable stacker.



Receiving screws used as portable bulk cement transfer plant
... to bulk trucks
... for cement treated base.



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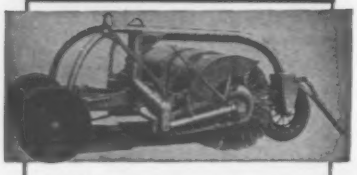
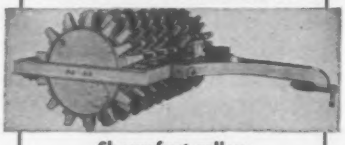
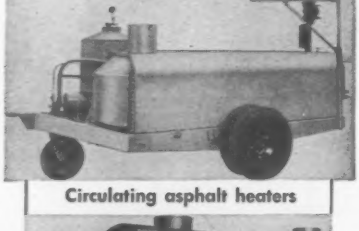


Roadsweepers, traction, engine-driven or tractor-mounted



Sheepsfoot rollers

Chip spreaders



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Pneumatic rollers, self-propelled or trailed

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(Continued from page 151)

George W. Kane, 111 Corcorane St. Bldg., Durham, N. C., CA $625,752, JUNIOR HIGH SCHOOL DURHAM, N. C. Bd. Educ., City Hall, Durham, N. C. Bids Mar. 4. CD 3/18, under LB.

Jones Bros. Co., Wilson, N. C., LB $463,925, CLASSROOM BLDG., GREENVILLE, N. C. East Carolina College, Greenville, N. C. Bids Mar. 25. CD 2/24.

▲ T. A. Loving & Co., Wachovia Bank Bldg., Goldsboro, N. C., CA $3,021,510, acc. alts.), 208,000 sq. ft. 380-bed Memorial HOSPITAL, RALEIGH, N. C. Wake Co. Hospital Auth., Court House, Raleigh, N. C. Bids Mar. 14. CD 3/21, under LB.

S. J. Curry & Co., Oglethorpe St., Albany, Ga., CA $946,440, POST OFFICE AND COURT HOUSE, (lease purchase project) BRUNSWICK, GA. General Services Admin., Public Bldgs., Service, Region, 450 Seventh St., Atlanta, Ga. Bids Mar. 11. Awarded Apr. 4. CD 3/13, under LB.

† Perusini Constr. Co., 1720 28th Ave. S., Birmingham, Ala. CA $155,960, nose cone assembly and check out facility, 1 story, 52x82 ft. air-conditioned bldg., etc., HUNTSVILLE, ALA. U. S. Eng., 2301 Grant St., Mobile, Ala. Bids Mar. 27. CD 3/6.

† Hodges & Co., 610 Chestnut St., Anniston, Ala. CA $114,009, OFF SITE FACILITIES for 200 unit Capehart Housing, FORT McCLELLAN, ALA. U. S. Eng., 2301 Grant St., Mobile, Ala. Bids Mar. 13. CD 3/6.

Foster & Creighton Co., American Nati. Bank Bldg., Nashville, Tenn., CA $889,225, POST OFFICE and COURT HOUSE (lease-purchase), BILOXI, MISS. General Services Admin., 19 & F Sts., N. W., Wash., D. C. Bids Mar. 6. CD 3/12, under LB.

East Baton Rouge Parish School Bd., Lloyd Funchess, supt., 805 St. Louis Ave., Baton Rouge, La., rejected bids Feb. 27, constr. East Baton Parish School Board OFFICE and SERVICE CENTER FACILITIES, Brookstown and Choctaw Rds., BATON ROUGE, LA. LB $680,000. CD 3/5, under LB.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

▲† Wisconsin—BA 4/24—U. S. Eng., 475 Merchandise Mart, Chicago 54, Ill., 800 ft. sheet steel piling, structural steel piling and rein.-con. of N. Breakwater in Milwaukee Harbor, CIVENG-11-032-28-43. $1,000,000. CD 9/23/55.

† O., Youngstown—AIRPORT IMPRVS.—BA 5/2—U. S. Eng., 925 New Federal Bldg., Pittsburgh 19, Pa., constr. electrical distr. facilities, Youngstown Municipal Airport, ENG-36-058-58-10. CD 9/17.

† O., Columbus—AIR BASE IMPRVS.—BA 5/6—U. S. Eng., 237 Fourth Ave., Huntington 18, W. Va. constr. gymnasium at Lockbourne Air Force Base, ENG-46-022-58-21. CD 4/3.

Ill., East St. Louis—BA 5/7—East Side Levee & Sanitary Dist. Board Trustees, Daniel Costello, pres., 2642 McCasland Ave., Proj. 17-B, two storm water pump station with equipment, auxiliaries and appurtenances at Harding Ditch, near L. & N. R.R. and St. Louis & Belleville Electric Railway for East St. Louis, in St. Clair Co. $100,000, Stephen Kernan, c/o owner, ch. engr. David J. Johnston, 129 N. 3 St., consult. engr. CD 2/10/50.

▲† Ohio and West Virginia—BA On Or About 5/28—U. S. Eng., 237 Fourth Ave., Huntington, W. Va. dam and appurtenant works for Dillon Reservoir Proj., Licking River, Ohio, CIVENG-46-022-58-47. CD 9/5.

BUILDINGS—BA

Mich., Hemlock—SCHOOL—BA 4/23—Bd. Educ., Hemlock Public Schools, Alfred Basner, secy., 49,000 sq. ft. high school. Plans deposit $50. H. E. Beyster & Assoc., 700 Griswold Bldg., Detroit, archts. CD 10/29.

Mich., Center Line—SCHOOL—BA 4/29—Bd. Educ., Center Line Pub. Schools, Edward Jenuwine, Busch Junior High School. Plans deposit $25. Smith, Tarapata, MacMahon, Inc., 894 S. Adams Rd., Birmingham, archt. CD 6/18.

Wis., Burlington—HOSPITAL—BA 4/29—Burlington Memorial Hosp., three 50 x 85 ft. and one 80 x 100 ft. hospital addn. $952,000. Brust & Brust, 135 W. Wells St., Milwaukee, Zone 3, archts. CD 8/29.

▲ Wis., La Crosse—HOUSING—BA 5/1—La Crosse Housing Auth., 307 Batavian Nat'l. Bank, thirty-eight, 74-units housing, paving, sewers, etc. $1,000,000. Plans deposit $50. Hackner, Schroeder & Assocs., 412 Rivoli Bldg., archts. CD 4/18.

▲ Ill., Chicago—RESEARCH—BA 5/8—University of Illinois, 1716 W. Taylor St., 1 story, brick, stone, medical research bldg., S. Parking Lot, W. Taylor and Wolcott St. $2,000,000. Skidmore, Owings & Merrill, 100 W. Monroe St., archts. CD 10/31/56.

HEAVY CONSTRUCTION—LB & CA

▲ OHIO—State Hy. Dpt., Dpts. Bldgs., Columbus, O.—Bruns Coal Co., Inc., P. O. Box 991, Zanesville, O., CA $5,153,632, est. $5,446,900, Type 1 and structures, 8.853 mi. SR 1-(19.20-22.12) (Village of Lakeville) ACL-1103 (17) Ashtabula Co.;
O.—The W. L. Harper Co., 2910 E. Highland Ave., Cincinnati, O., CA $1,356,505, est. $1,518,800 Part 2: Type T-35, 3.569 mi. SR 125-3.94, 4.83 Proj. F-416 (4) Hamilton Co.;
O.—H. H. Miller & Son, R. F. D. No. 1, New Milford, O., CA $2,334,305, est. $2,312,500 Type T-71 and structures 6.929 mi., SR 5-(0.00) 15.78 F-FG 1054 (1) Summit and Wayne Counties;
O.—Codell Constr. Co. and H. and F. H. Hosea Co., 125 S. Main St., Winchester, Ky., CA $3,399,484, est. $3,633,800, SR 1, Section 7/91 AC1-1105 (12) Harmony and Chester Twps; Type T-71 and structures, c. conc. 6.465 mi. State Route 1, in Harmony and Chester Twps; and constr. continuous bridge with concrete deck and concr. substructure; Bridge No. MRW 1-0825; County Rd. No. 170 over SR No. 1 continuous steel girder bridge with conc. deck and cons structure Bridge No. MRW 1-0911 County Rd. No. 25 over SR No. 1; continuous steel girder bridge with concrete deck and substructure Bridge No. MRW 1-1057 County Rd. No. 23 over SR No. 1; continuous concrete slab bridge with capped pile substructure Bridge No. MRS 1-1217 over Kokosing River, 6.465 mi. Morrow Co. Grand total $12,243,926. Bids Mar. 18. CD 3/27, under LB.

L & B Constr. Co., 1118 Home, Akron, O., LB $144,000, est. $196,000 12 in trunk sewer and laterals along Munroe Falls-Stow Village line, Munroe Falls-Stow, AKRON, O. Summit Co. Comrs., Court House, Akron, O. Leslie G. Wolfe, c/o owner, co. engr. Bids Mar. 24. CD 3/19.

▲ R. Hansen Co., 2646 N. Moreland Blvd., Cleveland 20, O., LB $1,761,042 (5 bidders) Contr. No. 6, sewage disposal plant, EUCLID, O. City, 585 E. 222nd St., Cleveland 23, O. Bids Mar. 31. CD 3/13.

▲ Robert R. Anderson Co., 4550 W. Patterson Ave., Chicago, Ill., CA $1,796,991, Congress St. Expressway from Elm St. to Mannheim Rd., Project I-01-4 (6), CHICAGO, ILL. Cook Co., County Bldg., Chicago, Ill. CD 3/18, under LB.

Brautigam Co., 4650 W. Lawrence Ave., Chicago, Ill., LB $208,860, Upper Des Plaines Intercepting Sewer, Cont. 11-C, Wheeling-Arlington Hts., Mt. Prospect, CHICAGO, ILL., Metropolitan Sanitary Dist. of Greater Chicago, 100 E. Erie St., Chicago, Ill. CD 3/18.

Fitz Simons & Connell Dredge & Dock Co., 10 S. LaSalle St., Chicago, Ill., LB $397,300, locks addns. and coffer dam, Chicago River and Lake Michigan, CHICAGO, ILL., Metropolitan Sanitary Dist. of Greater Chicago, 100 E. Erie St., Chicago, Ill. CD 3/12.

▲ Kenny Constr. Co., 3220 Oakton St., Skokie, Ill., LB $5,737,281, bridge for railroad grade separation, W. Wayman to W. Kinzie Sts., NW Rte. Superhighway, CHICAGO, ILL., City, City Hall, Chicago, Ill. CD 2/28.

▲ Overland Constr. Co., 205 W. Wacker Dr., Chicago, Ill., CA $3,789,534, bridge, Harrison St. at Chicago River, CHICAGO, ILL., City, City Hall, Chicago, Ill. CD 2/25, under LB.

Tomaro Contractors, 2727 E. Layton Ave., Cudahy, Wis., CA $117,887, (4 bidders), sewers in E. Kilbourn Ave., MILWAUKEE, WIS., City, City Hall, Milwaukee, Wis., Bids Mar. 27, awarded Apr. 1. CD 12/16.

Speedway Contracting, 6001 N. 91 St., Milwaukee, Wis., LB $165,214 (7 bidders), sanitary sewers in W. Lincoln Ave. and S. 108 St., WEST ALLIS, WIS., City, City Hall, West Allis, Wis., Bids Mar. 31. CD 3/26.

† Midwest Maintenance Co., 11710 Cloverdale, Detroit, Mich., LB $203,907, Schedules 1 to 5, (inclusive), supporting tactical facilities, Special AAA Sites, vicinity of Detroit, MICHIGAN. U. S. Eng., 1101 Washington Blvd., Detroit, Mich. Bids Mar. 11 CD 2/6.

† W. D. Gale, Inc., 7145 Tireman, Detroit, Mich., LB $93,789, electrical modification at SELFRIDGE AIR FORCE BASE, MICH. U. S. Eng., 1101 Washington Blvd., Detroit, Mich. Bids Mar. 25. CD 3/5.

BUILDINGS—LB & CA

Frank Messer & Sons, Inc., 4612 Paddock, Cincinnati, O., CA $889,700, MENS DORMITORY addn., University of Cincinnati, CINCINNATI, O. University of Cincinnati, Burnet Woods Park, Cincinnati, O. Bids Mar. 5, awarded Mar. 2. CD 4/2/58, under LB.

H. L. Vokes Co., 1000 Wayside Rd., Cleveland 10, O., CA Est. $500,000, design and construct 40-lane BOWLING ALLEY, CLEVELAND, O. Northfield Bowl, 22700 Shaker Blvd., Cleveland 22, O.

John Marquard & Sons, Inc., 21665 Center Ridge Rd., Cleveland 16, O., Own Forces, $885,000, 22 HOMES, Tonawanda Dr., ROCKY RIVER, O. Rollin Marquard, c/o owner, archt.

▲ James McHugh Constr. Co., 6449 E. South Park, Chicago, Ill., CA $4,294,260, HOSPITAL addn., 1835 W. Harrison St., CHICAGO, ILL., Cook Co., Chicago, Ill. CD 3/18.

▲ Herzog Building Corp., 1032 Lee St., Des Plaines, Ill., Own Forces $10,336,500, 460 HOMES, 266 Leahy Circle S., NE corner of 1155 Clark Lane, ELK GROVE, ILL.

† Livsey & Co., Inc., P. O. Box 5261, 273 Whiteford Ave. N.E., Atlanta 7, Ga., CA $630,495 CENTRAL HEATING PLANT AND STEAM DISTRIBUTION SYSTEM, at Granite City Engineer Depot, (IFB ENG-11-032-58-36), GRANITE CITY, ILL. U. S. Eng., 475 Merchandise Mart, Chicago, 54, Ill. CD 3/4.

Verne G. Oscarson Co., 3926 Touhy Ave., Lincolnwood, Ill., Own Forces, $900,000, 20 HOMES, Ridge Acres, LAKE FOREST, ILL. Martin J. Green, 730 Milburn, Evanston, Ill. archt.

Cross Country Homes Corp., Fox Lake Hills, Rte. 1, Lake Villa, Ill., Own Forces $375,000 25 HOMES, LIBERTYVILLE, ILL.

▲ A. Hedenberg & Co., Inc., 4621 E. Superior St., Duluth, Minn., CA $1,044,000, general contract, LABORATORY AND SCIENCE BLDG., SUPERIOR, WIS., Bd. Regents of State Colleges, State Capitol, Madison, Wis. Bids Mar. 6. CD 3/13, under LB.

▲ Castle Crest Homes, P. O. Box 229, Waukegan, Ill., Own Forces, $12,800,000, 870 HOMES, paving, sewage, water facilities, concrete sidewalks, curbs, gutters,

3300 blk. Stonegate Rd. (Castle Crest Subd.) WAUKEGAN, ILL.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

Minn., Albert Lea—BA 4/22—Freeborn Co., R. D. Hanson, aud., sand-grav. sub-base, grav. base and plant mixed bit. surf. 4.3 mi. between west line of Freeborn Co. and 5th St. in Village of Freeborn, SP 24-602-01(CSAH 29), Minn. Proj. S 6157(10); 2.7 mi. between CSAH 13 and 1 mi. south of Albert Lea, SP 24-615-01(CSAH 18), Minn. Proj. S 6193; 4.9 mi. between CSAH 13, 0.5 mi. east of Glenville and south limits of Hayward, SP 24-620-02 (CSAH 26) Minn. Proj. S 6196(2). $100,000. S. F. Branby, co. hy. engr. CD 8/26.

Minn., Pipestone — BA 4/22 — Pipestone Co., Marion Nobel, aud., grading betterments, grav. base and road-mixed bit. surf. 2.5 mi. between CSAH 18, 0.25 mi. east of Edgerton and east line of county, SP 59-602-01(CSAH 1), Minn. Proj. S 6012 (6), Plans deposit 90c; grade, grav. surf. 2.1 mi. northeast of Edgerton between CSAH 18 and east line of county, SP 59-605-01(CSAH 2), Minn. Proj. S 6018(3); 3 mi. between CSAH 8, 3 mi. north of Cazenovia and CSAH 10, SP 59-651-01 (CSAH 15), Minn. Proj. S 6033; 3 mi. between 4.5 mi. east of T.H. 23 and CSAH 18, SP 59-659-01 (CSAH 6), Minn. Proj. S 6735(1). Plans deposit $2.70. $125,000. R. D. Setterlund, co. hy. engr.

Neb., Omaha—BA 4/22—City, M. J. Dinnen, clk., City Hall, asphaltic resurf. program for city streets. $450,000. CD 3/20.

† **Missouri**—BA 4/23—U. S. Eng., 420 Locust St., St. Louis, Zone 2, constr. sewer alterations, Cape Girardeau Flood Protection, Proj. Item II-B, Cape Girardeau, ENG-23-065-58-34. CD 2/3, under LB.

Minn., Glencoe—BA 4/24—McLeod Co., Lida C. Luthens, aud., grade, grav. surf. 8.1 mi. between 1 mi. north of Glencoe and TH 7, SP 43-621-02 (CSAH 15), Minn. Proj. S 6302(2); grav. base and road-mixed bit. surf. 5.3 mi. between west line McLeod Co. and County State Aid Hy. No. 7, 1.5 mi. south of Hutchinson, SP 43-606-01 (CSAH 8), Minn. Proj. S 6132 (5). $110,000.

Tex., Plainview—RUNWAY, etc.—BA 4/28—City and Hale County, c/o Judge Lee Nowlin, 100x4,000 ft. paved runway, paved taxiways and lighting for new 4,000 ft. runway. $160,000. Plans deposit $25. Carter & Burgess, 1100 Macon St., Fort Worth, engrs.

† **Tex., Amarillo**—OPERATIONS BLDG. ADDN.—BA 5/7—U. S. Eng., Box 61, Tulsa 2, Okla. operations bldg. addn. (manual portion) Amarillo Air Force Base, ENG-34-066-58-49. $125,000.

† **Ark., Blytheville**—HYDRANT FUELING SYS.—BA About 5/8—U. S. Eng., P. O. Box 867, Little Rock, Job No. Blytheville AFB-ACRP-AF, hydrant fueling sys. Item No. 88-004 (121-123) Blytheville Air Force Base, ENG-03-050-58-41. CD 9/17.

▲† **Mont., Glasgow**—RUNWAY PRIMARY, etc.—BA 5/15—U. S. Eng., City-County Airport, Walla Walla, Wash. runway primary, apron operational alert, apron hangar access, apron operation heavy, and utilities, Glasgow Air Force Base, ENG-45-164-58-50 over $10,000,000. Plans deposit $100. Myron E. Page, Jr., c/o owner, engr. CD 9/19.

▲† **Missouri**—BA On Or About 5/20—U. S. Eng., 911 Walnut St., Kansas City, Zone 6, completion of Pomme de Terre Dam and Reservoir involving 3,655,000 cu. yd. earth excav., 1,070,000 cu. yd. rock excav., 4,620,000 cu. yd. embankment, 11,600 cu. yd. concrete, 891,000 lb. reinforcing-steel, 13,900 bbl. portland cement, 560 lin. ft. culvert pipe, 50,000 tons aggreg. and 139,000 gal. bit. materials for service roads. CIVENG-23-028-58-104. Plans deposit $25. CD 9/10.

† **Nebraska-Kansas**—BA 5/20—Bureau Reclamation, Dpt. Interior, Superior, Neb., earthwork and structures, Courtland Canal, Station 2809 plus 00 to end and laterals, waterway and drains Bostwick Division, Missouri River Basin Proj. near Courtland, Kan., Spec. DC-5039; adv. ENR. 4/17. CD 9/16.

Tex., Fort Worth—BA 5/20—City, c/o Thos. McCann, mayor, constr. 2 m.g.d. elevated water tank in Meadowbrook area. $330,000. Plans deposit $15. Carter & Burgess, 1100 Macon St., engr. CD 3/15/56.

BUILDINGS—BA

Mo., Normandy (St. Louis 21 P.O.)—HOSPITAL—BA 4/23—Normandy Osteopathic Hospital, 7840 Natural Bridge Rd., Zone 21, 3 story, 44x160 ft., brick, rein.-con. east wing hospital addn. to incl. addnl. rooms for medical, surgical and maternity patients and other facilities. Drake-O'Meara Assocs., 212 S. Bemiston Ave., Clayton, Zone 5, archts. CD 12/18.

Tex., Denton—INDUSTRIAL ARTS—BA 4/24—North Texas State College, Dr. J. C. Matthews, pres., 2 story, brick, tile, concrete, steel, industrial arts bldg. $650,000. Plans deposit $25. Wilson, Patterson & Assocs., 601 Bailey, Fort Worth, archts. CD 1/24.

▲ **Minn., St. Paul**—INFIRMARY HOME—BA 5/2—Bethesda Hospital, 599 Capitol Blvd., K. Holmquist,, admin., (selected list bidders) 4 story, 100-bed, infirmary home, Capitol Blvd. and Charles St. $2,000,000. Magney, Tusler & Setter, 303 Roanoke Bldg., Minneapolis, Minn., archts. CD 9/23.

HEAVY CONSTRUCTION—SLC

Mo., Springfield — TRANSMITTER PLANT — Television Station KTTS-TV, Independent Broadcasting Co., Springfield, soon lets contract 1 story, 11,000 sq. ft. addn. to TV fire-resistive transmitter plant. $187,000.

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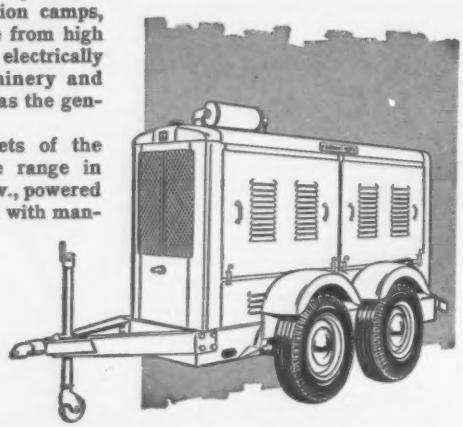

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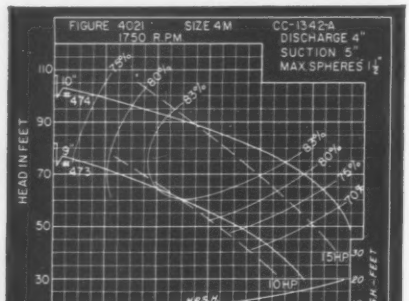

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Eugene F. Johnson & Assocs., Inc., Jefferson Bldg., 400 East McDaniel St., archt.

HEAVY CONSTRUCTION—LB & CA

Sorenson Bros., Albert Lea, Minn., LB **$167,254** (7 bidders), county road projs., grading and timber box culvert, **LITTLE FALLS, MINN.** Morrison Co., L. J. Bilistein, aud., Little Falls, Minn. Bids Apr. 1. CD 3/14.

Minnesota Valley Imprvt. Co., Granite Falls, Minn., CA **$98,944** (3 bidders), grav. base and road-mixed bit. surf. 5 mi. CSAH No. 6, 6 mi. east of Montevideo than 5 mi. north, **MONTEVIDEO, MINN.** Chippewa Co., Neil G. Miller, aud., Montevideo, Minn. Bids Mar. 18. CD 2/20.

Hurley Constr. Co., 403 South Robert St., St. Paul, Minn., LB **$208,671,** waste treatment plant, **MONTGOMERY, MINN.** City, F. J. Busta, clk., Montgomery, Minn. Bids Mar. 20. CD 3/6.

▲ **Orfei & Mariani,** 1156 Homer St., St. Paul, Minn., LB **$789,821** (3 bidders), Section A-68,800 lin. ft. sanitary sewer, sewage lift station, 1,300 lin. ft. water service connections, **ST. LOUIS PARK, MINN.** City, J. Justad, clk., St. Louis Park, Minn. Bids Mar. 31. CD 3/13;
Phelps-Drake Co., Inc., 5440 Douglas Dr. N., Minneapolis, Minn., LB **$986,041** (3 bidders), Section B-73,300 lin. ft. sanitary sewer, 100 GP M sewage lift station, 13,800 lin. ft. water service connections (St. Louis Park, Minn.)

▲ **M. J. McGough Co.,** 1954 University Ave., St. Paul, Minn., CA **$1,297,000,** purification and filtration plant addn., **ST. PAUL, MINN.** City, O. P. Simon, Jr., purch. agt., 253 City Hall, St. Paul, Minn. Bids Mar. 25. CD 3/31, under LB.

IOWA—State Hy. Comm., Ames, Bids opened 4/1,

Iowa—Christensen Bros., P.O. Box 523, Cherokee, Iowa, LB **$82,352,** Proj. I-IG-80-2(3) 76(I-IG-01-2(3), Group 2; LB **$77,547,** Group 3, Adair and Cass Counties;

Iowa—E. A. Moser Inc., Farmersburg, Iowa, LB **$248,859,** Proj. I-IG-80-2(3) 76(I-IG-01-2(3), Group 1, Adair and Cass Counties;

Iowa—Iowa Bridge Co., 5770 2 Ave., Des Moines, LB **$171,733,** Proj. F-442(7), Fremont and Page Counties.

▲ **IOWA**—State Hy. Comm., Ames, Bids opened 4/1,

Iowa—Highway Surfacers, Inc., 16 W. Main St., New Hampton, Iowa, LB **$117,517,** b. conc. 4.721 mi. Proj. S-244(3), Boone Co.; LB **$110,494,** b. conc. 4.499 mi. Proj. S-1587(2), Boone Co.; LB **$94,629,** b. conc. 4.101 mi., Proj. TBP-7, Boone Co.;

Iowa—Norris Constr. Co., 311 South Wapello St., Ottumwa, Iowa, LB **$250,551,** b. conc. 8.961 mi., Proj. S-705(3), Washington Co.; LB **$156,125,** rolled stone base and bit surf. treatment 8.044 mi. Proj. S-1760(5), Henry Co.; LB **$86,672,** rolled stone base and bit. surf. treatment 4.939 mi., Proj. S-1880(4), Henry Co.;

Iowa—Fred Carlson Co., Highway No. 9 East, Decorah, Iowa, LB **$626,440,** c. conc. 8.531 mi., Proj. F-1029(7), Greene Co.; LB **$206,985,** c. conc. 2.298 mi., Proj. F-506(4), Polk Co.;

Iowa—Alexander Constr. Co., 4641 Hiawatha Ave. S., Minneapolis, Minn., LB **$126,983,** b. conc. 4.967 mi. Proj. S-655(5), Clinton Co.; LB **$123,037,** b. conc. 5.232 mi., Proj. S-2697(1), Clinton Co.;

Iowa—E. C. Henningsen Co., Inc., 501 W. 2 St., Atlantic, Iowa, LB **$79,766,** b. conc. 1.993 mi., Proj. S-1261(3), Union Co.; LB **$93,363,** b. conc. 2.259 mi., Proj. S-2744(2), Union Co.;

Iowa—Central Constr. Co., 300 East Girard St., Indianola, Iowa, LB **$84,268,** grading 0.646 mi. Proj. I-IG-35-3(2), 77(I-IG-02-3(2), Polk Co.; LB **$277,155,** grading 6.821 mi. Proj. I-29-6(5) 129 (I-03-6(5), Woodbury Co.;

Iowa—J. D. Armstrong Co., Inc., 1621 Wilson St., Ames, Iowa, LB **$789,412,** c. conc. 2.493 mi., Proj. U-UG-889(6), Cerro Gordo Co.;

Iowa—E. M. Duesenberg, Inc., P.O. Box 1188, Mason City, Iowa, LB **$230,068,** c. conc. 7.586 mi., Proj. S-301(7), Palo Alto Co.;

Iowa—Judd Brown Constr. Co., R.R. No. 1, Mankato, Minn., LB **$77,315,** b. conc. 4.480 mi., Proj. SN-268(1, Mitchell Co.;

Iowa—Mauer Constr. Co., Sac City, Iowa, LB **$82,557,** b. conc. 2.971 mi., Proj. S-624(2), Sac Co.;

Iowa—H. F. Schroeder & Sons, 1002 North Clark St., Carroll, Iowa, LB **$523,897,** grading 6.229 mi. Proj. I-IG-80-2(3) 76(I-IG-01-2(3), Adair and Cass Counties.

Mason & Sanders, Green City, Mo., LB **$145,250** (4 bidders), sewage treatment plant, auxiliaries, appurtenances, HOLDEN, MO. City, Fred Miller, mayor, City Hall, Holden, Mo. E. T. Archer & Co., Railway Exchange Bldg., Kansas City, Mo., engrs. Bids Mar. 25.

S. M. Wilson & Co., 1616 Cleveland Ave., Granite City, Ill., CA Est. **$288,264,** gas heating Hangars 1 and 2, Lambert-St. Louis Municipal Airport, **ST. LOUIS COUNTY, MO.** Young Aviation Corp., Box 6056, Lambert-St. Louis Municipal Airport, St. Louis 21, Mo.

▲† **S. W. Hardwick,** Beardstown, Ill., LB **$1,186,632** est. $1,083,637, constr. channel cutoffs and levees, Section II, along Smoky Hill River, Salina, CIVENG-23-028-58-88, KANSAS. U. S. Eng., 1800 Federal Office Bldg., 911 Walnut, Kansas City 6, Mo. Bids Apr. 3. CD 3/10.

† **S. & T. Constr. Co.,** Altus, Okla., LB **$204,651,** est. $222,889, recreational workshop and dinghy shop, Altus Air Force Base, ENG-34-066-58-32, ALTUS, OKLA. U. S. Eng., Box 61, Tulsa, Okla. Bids Apr. 2. CD 3/27.

† **Gholson, Byars & Holmes,** 2113 San Mateo N.E., Albuquerque, N. Mex., LB **$399,849,** air-conditioning U. S. Post Office and Courthouse, MUSKOGEE, OKLA. General Services Admin., General Services Bldg., Wash. 25, D. C. Bids Mar. 25. CD 4/12/57.

Southwest States Telephone Co., Bryan, Tex. Owner Builds. $145,000 some cable and pole lines Brazos Co., TEXAS. CD 3/18.

Victoria County Electric Co-operative, Victoria, Tex. Owner Builds. $100,000 some rural pole lines (Tex. 96 AB-Victoria) TEXAS. CD 10/10/56.

Western Electric Co., c/o Interurban Bldg., Dallas, Tex. CA $400,000 laying telephone cable between Denison and Pottsboro, TEXAS. Southwestern Bell Telephone Co., 308 S. Akard St., Dallas, Tex.

▲† **McKenzie Constr. Co.**, 435 E. Mitchell, San Antonio, Tex. LB $3,374,759 Base Bid, 500 bed HOSPITAL addn., ENG-41-243-58-22, LACKLAND AIR FORCE BASE, TEX. U. S. Eng., 606 Santa Fe Bldg., Galveston, Tex. Bids about Apr. 1. CD 2/11.

West Texas Constr. Co., Box 5067, N. College St., Lubbock, Tex. CA $127,890 street paving, LUBBOCK, TEX. City, City Hall, Lubbock, Tex. Bids Mar. 13. CD 2/8/57.

City, City Hall, Paris, Tex. Owner Builds. $110,000, some water lines PARIS, TEX. Clyde H. Emmons, Paris, Tex., new city engr. Forrest & Cotton, 602 Vaughn Bldg., Dallas, Tex., engrs. CD 8/20/56.

Tellepsen Constr. Co., Box 2536, Houston, Tex. LB $115,270, enclosing drainage ditch rein.-con. box type, TEXAS CITY, TEX. Town, Town Hall, Texas City, Tex. Bids Mar. 19. CD 3/17.

† **Rainbow Electric Co.**, 2220 River Dr., Great Falls, Mont. CA $100,126, est. $109,840, ramp and hangar electrification, Malmstrom Air Force Base, ENG-45-164-58-35, GREAT FALLS, MONT. U. S. Eng., City-County Airport, Walla Walla, Wash. Bids Apr. 1. CD 2/26.

Oil Capital Constr. Co., 801 W. 23 St., Tulsa, Okla., CA $430,000, expansion 230 mi. crude oil line, between Lance Creek and Denver, Colo., WYOMING-COLORADO. Continental Pipe Line Co., 1000 S. Pine St., Ponca City, Okla.

▲ **NEW MEXICO**—State Hy. Dpt., State Hy. Bldg., Cerrillo Rd., Santa Fe,

N. M.—**J. W. Jones Constr. Co.**, 8800 Susan Dr. S.E., Albuquerque, N. M., CA $960,895, est. $1,158,782, (3 bidders) Proj. No. I-091-3(7), Bernardo-South, Socorro Co.;

N. M.—**Adams Constr. Co., Inc.**, Box 4098, Santa Fe, N. M., CA $177,897, est. $188,477 (3 bidders) Proj. No. I-093-4(7), Flying C Interchange, Torrance Co.;

N. M.—**Wayne A. Lowdermilk, Inc.**, Espanola, N. M., CA $1,082,621, est. $1,015,738 (3 bidders) Proj. No. F-013-1(3), Silver City-Central, Grant Co.;

N. M.—**Leslie Wheeler**, 2129 Lead Ave. S.E., Albuquerque, N. M., CA $192,279, est. $219,999, (3 bidders) Proj. No. FLHP-12(3) and F-031-1(5), 14 mi. North of Gallup, McKinley Co. Grand total $2,637,-941. Bids Mar. 28. CD 3/19.

NEW MEXICO—State Hy. Dpt., State Hy. Bldg., Cerrillo Rd., Santa Fe,

Imperial Paving Co., 700 E. Grand St., Oklahoma City, Okla., CA $224,249, est. $239,123, (3 bidders), Proj. No. S-1326(8), Blanco Bridge and approaches, San Juan Co. Bids Mar. 28. CD 3/19.

BUILDINGS—LB & CA

G. I. Johnson & Son Co., 848 West 79th St., Minneapolis, Minn., LB $396,102, general contract 1 story, 9 classrooms, etc. HIGH SCHOOL addn., FOLEY, MINN. Bd. Educ., M. Goggins, clk., Foley, Minn. Bids Mar. 21. CD 3/14, under LB.

▲ **Johnson, Drake & Piper, Inc.**, Baker Bldg., Minneapolis, Minn., LB $2,114,809. (8 bidders), general contract Glenwood Redevelopment Proj., Lyndale HOMES, 192 family units, Site Q South, MINNEAPOLIS, MINN. Minneapolis Housing and Redevelopment Auth., Metropolitan Bldg., R. T. Jorvig, exec. dir., Minneapolis, Minn. Bids Apr. 2. CD 3/5.

▲ **Rinderknecht Constr. Co.**, 113 F Ave., N. W., Cedar Rapids, Iowa, CA $1,256,000. general contract, 6 story, bsmnt., 95 bed hospital addn., CEDAR RAPIDS, IOWA, Mercy Hospital, 835 6 Ave., S. E., Cedar Rapids, Iowa. Bids Mar. 4. CD 1/28;

Galbraith Heating Co., 222 1st St. N. E., Cedar Rapids, Iowa, CA $723,000, heating, ventilating, air-conditioning and plumbing (Cedar Rapids, Iowa).

J. S. Alberici Constr. Co., 1550 Irving Ave., St. Louis, 20, Mo., CA Est. $240,000, 3 story, 40 x 92 ft., brick, steel, concrete addn. to Power House, 3809 Union Blvd., ST. LOUIS, MO. Chevrolet St. Louis Division of General Motors Corp., 3809 Union Blvd., St. Louis 15, Mo. Boddy, Benjamin & Woodhouse, Inc., 28 W. Adams, Detroit, Mich., archts.

▲ **Fruin-Colnon Contg. Co.**, 1706 Olive St., St. Louis 3, Mo. and **Paul Tishman General Contractor, Inc.**, 21 East 70th St., New York 21, N. Y., CA Est. $15,-000,000. Plaza Housing Proj., six 13 story APARTMENTS, incl. underground PARKING GARAGE, 14 Marekt 18 and Olive Sts., ST. LOUIS, MO. Urban Redevelopment Corp., c/o Hellmuth, Obata & Kassabaum, Inc., archt., 315 N. 10 St., St. Louis 1, Mo., and Harris Armstrong, 180 S. Sappington Rd., Oakland 22, Mo., archts. CD 4/22/55.

Martin Realty & Investment Co., 7415 Sharp Ave., St. Louis 16, Mo., Owner Builds, $345,000, three 2 story, bsmnt., (12 units each) APARTMENT, 3314 Russell Blvd., ST. LOUIS, MO. Hunter-Hunter & Assocs., 2217 Divot Dr., Kirkwood 22, Mo., archts.

Hercules Constr. Co., 9800 Page Ave., Overland 14, Mo., CA $400,000, 1 story, 163 x 277 ft., brick, hollow masonry units, steel, etc. WAREHOUSE and 1 story, 78 x 163 ft. District OFFICE BLDG., Lindberg Blvd., ST. LOUIS, COUNTY, MO. Firestone Tire & Rubber Co., Real Estate Dpt., Akron, Ohio. Bids Mar. 4. CD 2/13.

▲ **The Baldwin Co.**, 322 Gaines St., Little Rock, Ark. LB $1,151,556, COTTAGE-TYPE SCHOOL, CONWAY, ARK. Arkansas Children's Colony, Conway, Ark. Bids Apr. 2. CD 3/13.

▲ **The Bracy Corp.**, Jack B. Bracy, secy.-treas. 5th and Vine Sts., Little Rock, Ark. Separate Contracts. $2,000,000 overall. 190 HOME subdivision Proj., 60 acre tract on hy. 10 near Mississippi Ave., LITTLE ROCK, ARK.

▲ **Willis Thames & Sandy Hawthorne, Realtors-Builders**, 4525 Beaumont Dr., Beaumont, Tex. Owner Builds. $360,000, 12 DWELLINGS; $362,500, 15 DWELLINGS; $351,000, 13 DWELLINGS in west BEAUMONT, TEX. Grand total, $1,073,500. CD 3/14.

McRan Co., Wharton, Tex. CA $125,000 GRAIN SORGHUM DRYER and STORAGE ELEVATOR, BLESSING, TEX. Bay Grain Co., c/o Paul Langham, Bay City, Tex. CD 4/7.

Morrison & Morrison, Builders & Associated Companies, 3023 S. Marsalis Ave., Dallas, Tex. Owner Builds. $350,000, 11 model HOMES, Glen Oaks Addn., DALLAS, TEX. CD 3/11.

L & L Builders, 7 Half Moon Dr., El Paso, Tex. Owner Builds. $355,000, 55 low priced DWELLINGS (not prefabricated type), EL PASO, TEX.

J. E. Lyon Development Co., (Developers,) c/o Prudential Bldg., Houston, Tex. Owner Builds. $359,500, 33 DWELLINGS; $365,000, 18 DWELLINGS, adjacent to Tanglewilde Subdivision, HOUSTON, TEX. CD 3/13.

H. L. Pryor, 4018 Marquet St., Houston, Tex. Force Account. $350,000, 8 all masonry DWELLINGS; $365,000, 16 DWELLINGS, off Memorial Dr. HOUSTON, TEX. CD 3/19.

T. A. Robinson Jr. & Geo. Meyer, c/o Meyerland Co., 4703 Jason St., Houston, Tex. Owner Builds. $365,500, 10 DWELLINGS, in 5th section Meyerland Subdivision, HOUSTON, TEX. CD 12/26.

John D. Townsend, Builder, 5502 Lincrest, Houston Tex. Purchase and Hire. $362,500, 33 DWELLINGS; $375,-000, 25 DWELLINGS, in section 1 off Telephone Rd. past airport, HOUSTON, TEX. CD 3/6.

J. M. Odom, Inc., 1925 Fort Worth St., Dallas, Tex. LB $588,525. Base Bid. YMCA BLDG., LONGVIEW, TEX. Young Mens Christian Assn., Longview, Tex. Bids Mar. 20. CD 3/10.

▲ **Clanahan Constr. Co.**, 116 W. 5th St., Tyler, Tex. CA Est. $2,000,000, container mfg. PLANT: units, TYLER, TEX. Continental Can Co., Inc., 100 E. 42nd St., New York, N. Y. CD 4/4.

▲ **Lembke Constr. Co.**, 1719 5 St. N. W., Albuquerque, N. M., CA $1,329,983. 3 story DORMITORY, ALBUQUERQUE, N. M. University of New Mexico, Albuquerque, N. M. CD 2/25.

Stringer Constr. Co., 718 E. Yale, Lubbock, Tex. Owner Builds. $95,000, 102,052 sq. ft. WAREHOUSE, LUBBOCK, TEX. CD 4/4.

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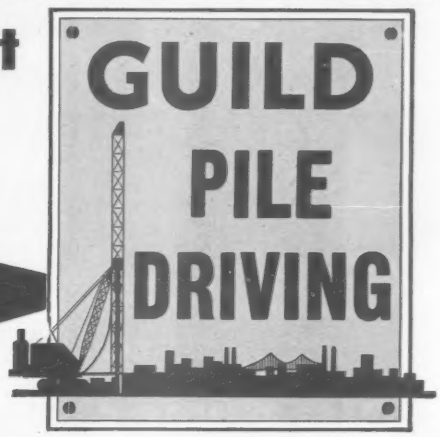

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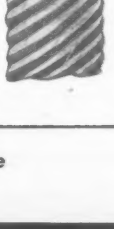

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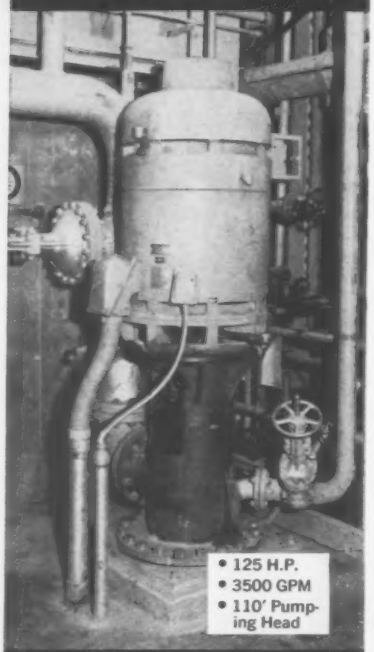

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FAR WEST

HEAVY CONSTRUCTION—BA

† **Wash., Othello**—OPERATIONS BLDG.—BA 4/22—U. S. Eng., 4735 E. Marginal Way, Seattle, Zone 4, 3680 sq. ft. addn. to operations bldg. at Othello Air Force Station, ENG-45-108-58-102. Extended date, CD 3/24.

Ore., Cornelius—BA 4/23—City, City Hall, 42,070 lin. ft. 6- to 15-in. sewers, sewage filter plant. Plans deposit $50. Carl E. Green, Henry Bldg., Portland, engr. CD 2/1/56.

† **Calif., Lompoc**—FIRE STATION, etc.—BA 4/29—U. S. Eng., 751 S. Figueroa St., Los Angeles fire station, air freight terminal, etc. at Cooke Air Force Base, ENG-04-353-58-69. $600,000. CD 3/5, under Public Bldgs.

Calif., Petaluma—DRILL HALL—BA 4/29—State Div. Architecture, 1120 N. St., Sacramento, drill hall either poured in place or tilt up concrete, for Dpt. Military Affairs Armory W. O. 4153GCM-DA-04-376-NG-394. $125,500. 4/17.

Calif., Fullerton—DRILL HALL—BA 4/30—State Div. Architecture, 1100 S. Grand Ave., Los Angeles, walled in place or tilt up concrete 60 x 120 ft. drill hall and 20 ft. wide leanto on 2 sides and part of front for armory facilities Dpt. Military Affairs. W. O. 4277GCM DA-04-376-NG-263. $160,000. Plans deposit $25.

† **Wash., Oak Harbor**—AIR FIELD APPROACH LIGHTING—BA 5/1—P. Wks. Officer, Thirteenth Naval Dist., Naval Station, Seattle, install air field approach lighting at Ault Field on Whidbey Island.

† **Wash., Spokane**—AIRPORT IMPRV.—BA 5/1—U. S. Eng., 4735 E. Marginal Way, Seattle, Zone 4, regrading outfall ditch on Brooks road and install 1,000 ft. drain pipe, Fairchild Airport Base. ENG-45-108-58-118. CD 9/16.

▲ **Calif., Los Angeles**—BA 5/2—Los Angeles Water & Power Dpt., 311 S. Spring St., constr. Granada trunk line exten., Unit 3, approx. 29800 ft. 48 in. pipe $1,000,000. CD 11/20/56, under Public Bldgs.

† **Ore., Baker**—AIR FORCE IMPRVS.—BA 5/8—U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash., r.c. receiver bldg. and rein-con. addn. to transmitter bldg. at Air Force Station, ENG-45-108-58-116.

† **Wash., Blaine**—TRANSMITTER AND RECEIVER—BA 5/8—U. S. Eng., 4735 E. Marginal Way, Seattle, Zone 4, 1,800 sq. ft. rein-con. addns. to transmitter and receiver bldgs. at Blaine Air Force Station, ENG-45-108-58-118.

▲† **Wash., Moses Lake**—BA 5/13—U. S. Eng., City-County Airport, Walla Walla, operational alert apron, Larson Air Force Base, ENG-45-164-58-52. $1,000,-000-$5,000,000. Plans deposit $100. Myron E. Page, Jr., c/o owner, engr. CD 9/16.

▲† **California**—BA 5/18—U. S. Eng., 1209 8th St., Sacramento, constr. lock and barge canal bridge, units of Sacramento Deep Water channel $6,000,000. CD 9/10.

▲† **Idaho, Mountain Home**—ALERT APRON, etc.—BA 5/20—U. S. Eng., City-County Airport, Walla Walla, Wash., airfield alert apron, taxiways, Mountain Home Air Force Base, ENG-45-164-58-51. $1,000,000-$5,000,000. Plans deposit $100. Myron E. Page, Jr., c/o owner, engr. CD 3/12.

BUILDINGS—BA

† **California**—BA 4/29—U. S. Eng., 751 S. Figueroa St., Los Angeles, MCA permanent Family housing Special AAA Sites LA-94 and LA-98, Solemint, Los Angeles Co. $500,000.

† **Nev., Reno**—ARMY RESERVE CENTER, etc.—BA 4/29—U. S. Eng., 1209 8th St., Sacramento, Calif. army reserve center bldg., maintenance shop bldg. and site grading, Spec. 2264, ENG-04-167-58-38. $250,000. CD 11/30/56.

▲ **Calif., Eureka**—COURTHOUSE—BA 4/30—Humboldt Co., c/o Clerk, Courthouse, courthouse. $3,250,000. CD 11/13/56.

▲ **Calif., San Diego**—RESIDENCE HALLS—BA 5/7—State Div. Architecture, 1100 S. Grand Ave., Los Angeles, five 3 story 194,000 sq. ft. reinforced brick, concrete residence halls to house 1,000 students at San Diego State College, W. O. 4005GC-36. $2,993,-000. Plans deposit $75. CD 7/24.

HEAVY CONSTRUCTION—LB & CA

▲ **Russell Oliver**, Sandpoint, Idaho, CA Est. **$1,390,000**, 48 mi. 230,000 volt transmission line from Noxon Rapids to Pine Creek, IDAHO-WASHINGTON, Washington Water Power Co., W 825 Trent St., Spokane, Wash. CD 1/13/56.

▲ **WASHINGTON**- -State Hy. Comn., Dpt. Hys., Olympia, Bids opened 4/1,

Wash.—**Erickson Paving Co.**, Bellevue, Wash., LB **$804,-274** (10 bidders), clearing, draining, grading, installing fencing and constr. 2 rein.-con. slab bridges, rein.-con. box girder bridge and prestressed concrete bridge on 6.795 mi. Primary State Hy. 11, Ritzville to Tokio-Unit 2, FAP No. I-002-5(6), Adams Co.; LB **$107,-215** (16 bidders), clearing, draining, grading, 1.862 mi. Sec. State Hy 1-D, Clinton to Lone Lake Rd.; FAS No. S-0211(2), Island Co.;

Wash.—**M. J. Kuney Co.**, N. 120 Ralph St., Spokane, Wash., LB **$225,091** (8 bidders), surf. constr. bit. surf. treatment, const. cement-treated base, asphalt, concrete paving and installing illuminization on 5.613 mi. Primary State Hys. 3 and 8, Zillah vicinity and from Junction with Sec. State Hy. 3-A to Toppenish Creek, FAP No. F-018-3(5), Yakima Co.

Wash., **F. G. Bauline, Inc.**, Yardley, Wash., LB **$99,016** (3 bidders), clearing, draining, grading, surf. and bit. surf. treatment 3.686 mi. Montgomery Ridge Rd., FAS No. S-1288(1), Asotin Co.;

Wash.—**Strong & Mac Donald, Inc.**, 4045 Ruston Way, Tacoma, Wash., LB **$285,831** (9 bidders), draining, grading, surf. constr. bit. surf. treatment and stockpiling mineral aggregates on 3.677 mi. Primary State Hy. 2, Mill Creek to junction with Primary State Hy. 15, FAP No. F-028-1(15), Chelan Co.;

Wash.—**H. Hagman**, Hazelwood Tracts, Spokane, Wash., LB **$359,884** (11 bidders), clearing, draining, grading, surf. and constr. steel plate girder bridge on 1.302 mi. Primary State Hy. 2, Dryden to Great Northern Railway undercrossing, FAP No. F-FG-028-1(13), Chelan Co.;

Wash.—**Associated Sand & Gravel Co.**, 2508 Colby St., Everett, Wash., LB **$213,636** (5 bidders), grading, surf. constr. bit. surf. treatment, asphalt concrete paving and instaling illumination on 4.646 mi. Sec. State Hy. 1-A, Jct. SSH 15-A to Getchell Rd., FAS No. S-0202(8), Snohomish Co., CD 3/18.

WASHINGTON—State Hy. Comn., Dpt. Hys., Olympia, Bids opened 4/1,

Wash.—**Ruud Constr. Co.**, Realty Bldg., Spokane, Wash., LB **$115,975** (8 bidders), rein.-con. flat slab bridge and rein.-con. box girder bridge for H. P. railway overcrossing and Cottonwood Creek bridge on 0.071 mi. Primary State Hy. 2 near Davenport, FAP No. F-FG-028-4 (3), Lincoln Co.;

Wash.—**R. L. Martin Co.**, Foothills Rd., Oswego., Ore., LB **$225,605** (12 bidders), steel plate girder bridge for N. P. railway undercrossing on Primary State Hy. 1 at Lakeview together with clearing, draining, grading, and surf. 0.095 mi., FAP No. I-IG-001-3(35), Pierce Co.;

Wash.—**E. Selene & Sons**, 210½ W. Chestnut St., Bellingham, Wash., LB **$89,133** (10 bidders), 2 rein.-con. box girder bridges for Lakeway Dr. overcrossing on 0.016 mi. Primary State Hy. 1, FAP No. I-001-5(25), Whatcom Co., CD 3/18.

† **James I. Barnes Co.**, Central Bldg., Seattle, Wash. LB **$370,602**, est. $413,495 (6 bidders), service club, Larson Air Force Base, ENG-45-164-58-34, MOSES LAKE, WASH. U. S. Eng., City-County Airport, Walla Walla, Wash. Bids Apr. 3. CD 2/26.

† **Parker Schram Co. Bldrs.**, Exchange Bldg., Portland, Ore. LB **$427,713**, (6 bidders) Inv. No. 8675, Schedule 1: 21.2 mi. and Schedule 3: 22.1 mi. Santiam-Alvey section, McNary-Alvey 287-KV line No. 1, Linn and Lane Counties, OREGON. Bonneville Power Admin., 1001 N. E. Lloyd Blvd., Portland, Ore. L. C. Stewart, c/o owner engr. Bids Apr. 1. CD 3/7.

▲† **Frederickson & Kassler, & Stolte, Inc.**, 212 E. 13th St., Sacramento, Calif. CA **$4,373,874**, est. $5,500,000, constr. airfield pavement at Cooke Air Force Base, ENG-04-353-58-38, LOMPOC, CALIF. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. Bids Mar. 28, awarded Mar. 29. CD 4/1, under LB.

† **P. J. Walker Co.**, 3900 Whiteside Ave., Los Angeles, Calif. LB **$426,000**, est. $600,000 nose cone training facility at Cooke Air Force Base, ENG-04-353-58-63, LOMPOC, CALIF. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. Bids Mar. 28. CD 3/5/57.

▲ **Webb & White and Distell Constr. Co.**, 7220½ Melrose Ave., Los Angeles, Calif. LB **$6,157,540**, (5 bidders) constr. 5 siphons along Colorado River Aqueduct between San Jacinto and Val Verde Tunnels in Riverside County, 13 ft. diam. pipe approx. 7 mi. in length, LOS ANGELES, CALIF. Metropolitan Water Dist. of Southern California, 306 W. 3 St., Los Angeles, Calif. Bids Apr. 3. CD 3/24.

BUILDINGS—LB & CA

Far West Constr. Co., 608 W. 44 St., Seattle, Wash., CA Est. **$450,000**, branch BANK BLDG., BELLINGHAM, WASH., Seattle-First National Bank, 2nd and Cherry St., Seattle 4, Wash. J. W. Maloney, Central Bldg., Seattle 4, Wash., archt.

† **Wyatt & Kipper Engineers, Inc.**, 3214 16 Ave. S.W., Seattle, Wash. CA **$259,878**, est. $298,016 (14 bidders) 40 x 56 ft. rein.-con. central HEATING PLANT with 2 high-pressure steam boilers and two 25,000 gal. underground fuel oil tanks, ENG-45-108-58-72, FORT LEWIS, WASH. U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash. Bids Apr. 1. CD 2/27.

▲ **Cawdrey & Vemo**, 3601 Fremont Ave., Seattle 3, Wash., CA **$2,042,598**, 5 story, 80,000 sq. ft. steel frame OFFICE and GARAGE annex to bank bldg., SEATTLE, WASH. National Bank of Commerce, 2 Ave. and Marion St., Seattle 4, Wash. Bids Mar. 11. CD 3/20, under LB.

Waldo S. Haride & Son, 191 Park Ave., Eugene, Ore. LB **$819,603**, (4 bidders) general contract Men's DORMITORY, University of Oregon, EUGENE, ORE. Bd. Higher Educ., University of Oregon, Eugene, Ore. CD 2/12.

Hoffman Constr. Co., 715 S.W. Columbia St., Portland, Ore. CA **$300,000**, color packaging PLANT, MILWAUKIE, ORE. Pak-Well Paper Products Co., Kellogg Park, Milwaukie, Ore. Jensen & Gilham, 2266 N. W. Lovejoy St., Portland, Ore., archts. Awarded Apr. 2.

Charles W. Devore, P. O. Box 37, Garden Grove, Calif. LB **$398,000**, (10 bidders) PRIMARY SCHOOL NO. 3 on Villanova Ave. between Notre Dame and Loyola Rd., COSTA MESA, CALIF. Costa Mesa School Dist., 1758 Tustin Ave., P. O. Box 517, Costa Mesa, Calif. Bids Mar. 27. CD 3/17.

Coordinated Constructors, Inc., 12901 S. Crenshaw Blvd., Hawthorne, Calif. CA **$180,000**, 30,000 sq. ft. tool and die FACTORY, DOMINGUEZ, CALIF. Carson Estates, 5410 Wilshire Blvd., Los Angeles, Calif. Quinton Engineers, Ltd., 812 W. 8th St., Los Angeles, Calif., engrs.

▲ **Hilp & Rhodes,** 918 Harrison St., San Francisco, Calif. CA **$1,462,500,** 2 story rein.-con. DEPARTMENT STORE in Manchester Shopping Center, 110,000 sq. ft. off street parking, FRESNO, CALIF. The Pacific Mutual Life Insurance Co., c/o Walter Wagner & Partners, archts., 1830 Van Ness Ave., Fresno, Calif. Bids Mar. 27. CD 4/7, under LB.

Wm. Lieberman Co., 9548 W. Pico Blvd., Los Angeles, Calif. CA **$134,000,** 240 x 320 ft. concrete SHOP BLDGS. GARDENA, CALIF. The Duetsch Co., 7000 S. Avalon Blvd., Los Angeles, Calif.

Carl O. Larson, 703 W. 17th St., Santa Ana, Calif. CA **$582,888,** est. $500,000, all alternates incl., frame, stucco, brick addns. to Orange HIGH SCHOOL, ORANGE, CALIF. Orange High School Dist., Orange, Calif. Bids Mar. 26. CD 4/3, under LB.

▲ **James I. Barnes Constr. Co.,** Box 1073, Pomona, Calif. and **Kemp Bros. & George K. Thompson,** 8750 Mettler St., Los Angeles, Calif. LB **$1,219,000,** (identical bids) general constr. Phase 2, 5 story, rein.-con. addn. to San Bernardino County HOSPITAL, SAN BERNARDINO, CALIF. Bd. Supervs. San Bernardino Co., Courthouse, San Bernardino, Calif. Bids Mar. 31. CD 3/12.

J & Q Plumbing Co., 5833 Jurupa Ave., Riverside, Calif. LB **$524,568** mechanical (San Bernardino, Calif.)

▲ **Trepte Constr. Co., Inc.,** P. O. Box 1231, San Diego 12, Calif. CA **$1,762,000** general work. 3 story, 2 bsmnts. with about 105,000 sq. ft. floor area SCIENCE BLDG. addn. at San Diego State College, SAN DIEGO, CALIF. State Div. Architecture, 1120 N. St., Sacramento, Calif. Bids Mar. 26, awarded Mar. 31. CD 3/31, under LB.

CANADA

HEAVY CONSTRUCTION—BA

▲ **Que., Montreal**—BA 4/23—City, City Hall, sixth section Decarie-Raimbault collector sewer between Vezina St. and Queen Mary Rd. Over $1,000,000. Plans deposit $200.

▲ **Que., Montreal**—RECREATION CENTRE—BA 4/30—City, City Hall, 1 story, 200x300 ft. recreation centre to provide indoor swimming pool, gymnasium, recreation hall, etc., Cote St. Paul Park, $1,200,000. Plans deposit $300. Larose & Larose, 8 Roselawn Cresc., Mount Royal, Montreal, archts. Brouillet & Carmel, 3600 Barclay Ave., engrs. CD 1/23.

BUILDINGS—BA

Ont., Ottawa—PLANT—BA 5/17—Dpt. P. Wks., Hunter Bldgs., constr. Central Heating Plant, 2 story, bsmnt. 131 x 206 ft. at rear, with fourth and fifth floors about 35 x 150 ft., rein.-conc. fdn. and frame, steel beams, rein.-con. constr. throughout, face brick walls high temperature hot water heating by coal, Riverside Dr., Owner $350,000. Hazelgrove, Lithwick & Lambert, 575 Laurier Ave. W., Ottawa, Ont., archts. R. C. Gauthier, 250 Besserer Ave., engr. CD 12/14/49.

HEAVY CONSTRUCTION—LB & CA

▲ **J. D. Sterling Ltd.,** 940 Cote de Liesse Rd., Montreal, Que., CA **$2,293,361,** constr. 50 m.g. Rosemount Reservoir, bounded by Beaubien, Bellechase, 16th and 18th Aves., MONTREAL, QUE. City, City Hall, Montreal, Que. Bids Feb. 12, awarded Mar. 28. CD 2/24, under LB.

BUILDINGS—LB & CA

Bird Constr. Co. Ltd., Sargent and Erin Sts., Winnipeg, Man., LB **$519,113** (13 bidders) Government BLDG., OFFICE, THE PASS, MAN. Manitoba Dpt. P. Wks., Legislative Bldg., Winnipeg, Man. Bids Mar. 28. CD 3/20.

▲ **Canadian Engineering & Contg. Co. Ltd.,** 25 Hughson St. S., Hamilton, Ont., CA **$1,000,000** (7 bidders) 2 story, 180 sq. ft. poured concrete fdns., steel frame, brick PLANT OFFICE addn., HAMILTON, ONT. The Steel Co. of Canada Ltd., Wilcox St., Hamilton, Ont. Bids Mar. 26, awarded Mar. 28. CD 3/14.

▲ **Carter Constr. Co. Ltd.,** 419 Cherry St., Toronto, Ont., CA Est. **$2,500,000** (6 bidders) 1 story warehouse with second story office section, 375,000 sq. ft., 520x720 sq. ft. poured concrete fdn., structural steel frame, masonry walls, WAREHOUSE and OFFICE, 18th St., TORONTO, ONT. Goodyear Tire & Rubber Co. of Canada Ltd., Lake Shore Rd., New Toronto, Ont. Awarded Mar. 26. CD 1/16/58.

J. M. E. Fortin, Inc., 58 Dahlia Ave., Dorval, Que. Owner Builds. **$450,000,** 48 semi-detached unit HOUSING on new streets, HAUTERVIVE, QUE.

ALASKA

BUILDINGS—LB & CA

▲† **Morrison-Knudsen Co., Inc.,** 319 Broadway, Boise, Idaho, LB **$1,425,308** (3bidders) constr. LIVING QUARTERS and relocating CAA Facilities, Bethel, Inv. 5-58-56, ALASKA. Civil Aeronautics Admin., Anchorage, Alaska. Bids Mar. 27. CD 3/13.

U. S. POSSESSIONS

BUILDINGS—BA

▲† **Guam**—HOUSING—BA 5/13—Strategic Air Command, Offutt Air Force Base, Omaha, Neb., housing. $20,000,000. Daniel, Mann, Johnson & Mendenhall, 3325 Wilshire, Los Angeles, Calif., archts. CD 3/13.

AMERICANS ABROAD

BUILDINGS—BA

† **Ecuador, Quito** — OFFICE — BA 5/1 — Dpt. State, Foreign Bldgs. Office, Wash., D. C., U.S.A., Embassy Office Bldg. Extended date. Vincent G. Kling, 917 Corinthian Ave., Phila., Pa., U.S.A., archt. CD 1/31.

PROPOSED PROJECTS

WATER SUPPLY

Mich., Saginaw—City, C. A. Miller, mgr., water sys. imprvts., incl. raw water storage, transmission mains, high service pumping unit. $533,000. McNamee, Porter & Seeley, 2223 Packard, Ann Arbor, engrs. CD 6/2/55.

Tex., Terrell—City, City Hall, large water main line. $250,000.

Tex., Terrell—City, City Hall, water filtration plant unit, $75,000, water distr. lines, $100,000. water storage, $60,000.

▲ **Utah, Salt Lake City**—Salt Lake City Metropolitan Water Dist., Tribune Bldg., voted $8,000,000 bonds water treatment plant south of here. CD 9/28/55, under Salt Lake City Corp. as owner.

Wash., Tacoma—City, City Hall, reconstr. spillway at McMillan reservoir, $240,000; reconstr. tunnel on Green River supply line, $90,000, J. A. Kuehl, water supt., bids this year.

SEWERS, WASTE DISPOSAL

Conn., Middletown—City, Dpt. P. Wks., City Hall, sanitary sewers, incl. interceptor main, Lakeside Dist., $200,000.

N. J., Little Silver—Borough of Little Silver, Borough Hall, sewerage sys., Over $100,000, Lanning Sanitation Eng. Co., Inc., 1100 S. Broad St., Trenton, consult. engr.

N. Y., Gowanda—Town, Town Hall, voted bonds Mar. 18, sewage treatment plant. $261,000. CD 3/7.

▲ **O., Cleveland**—City, Dpt. P. Service, Louis L. Drasler, dir., City Hall, Zone 14
1958 CAPITAL IMPROVEMENT PROGRAM
sewer and appurtances in Broadway S.E. from E. 71 St to 78th St., Ord. 577-58, $180,000. CD 2/5.
Cuyahoga River interceptor sewer in Independence Rd. from Dille to Stillson Aves., Ord. 589-58, $300,000. CD 8/5/54.

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sewers, etc., Invermere Ave. from Lee to Strandhill Rds., Ord. 568-58, $200,000, CD 8/2/54.
sewers, etc., Lamont Ave. from E 93 to E 97 Sts.; E 93 St. from Hough to Lamont Ave. and E. 97 St. from Lamont to Euclid Ave., Ord. 568-58, $200,000, CD 2/5.
sewers, etc., Forestwood Ave. from Rocky River Dr. to W. 192nd. St., Ord. 568-58, $100,000. CD 2/5.
sewage pumping station for low-level sewer dist. at Front Ave., Ord. 579-58, $85,000, CD 2/5.
sewers, imprvs. in Garden Blvd. from E. 175 to 357 ft. easterly; East 175th St. from DeForest Ave. to Garden Blvd. and E. 176th St., from north line of Howard Morrison subdivision to Garden Blvd., Ord. 568-58, $75,000, CD 2/5.
sewers, appurtenances, in Pearldale Ave. from Valley-view Ave., etc. Ord. 568-58, $90,000, CD 2/5.
sewer in W 137 St. from Lorain Ave. to 1608 North Allison Ave., Ord 587-58, $100,000, CD 2/5.
sewer, appurtenances in E 152 St. from 50 ft. south of Hartley Rd. to Woodworth Ave., Ord. 568-58, $175,000, CD 2/5. Jay R. Katz, city engr.

O., Painesville—Comrs. Lake Co., Court House, sanitary sewerage system for central Lake Co.; Mentor Village; Reynolds Rd. and Brentmoor; Fairgrounds Dist.; Mentor-on-the-Lake area; sewage plant on Mentor Marsh Creek, Mentor, Mentor-on-the-Lake Villages, Mentor and Painesville Townships. $7,000,000. Burgess & Niple, 2010 W. 5th Ave., Columbus, consult. engrs. CD 2/2/56.

Pa., Norristown—West Norristown Twp. Comn., Norristown, incinerator plant. $100,000. John L. Dzedzy, Norristown twp. engr.

Tex., San Antonio—Bexar Co. Water Control & Imprv. Dist. 15, c/o Comrs. Court, c/o Courthouse, sewers $100,000 Wyatt C. Hedrick & Assocs., 5201 Fannin, Houston, consult. engrs. CD 1/7.

Wash., Seattle—City, County-City Bldg., Seattle, Zone 4, trunk sewer in Delridge Valley to serve area between W. Spokane St. and south city limits along Delridge way, $500,000. R. W. Morse, city eng. Bids may be called this summer.

BRIDGES

▲ **IDAHO**—State Hy. Dpt., Boise,
Bannock Co.—4-lane overpass, railroad 0.5 mi. U. S. 30 N, Benton St., city of Pocatello, $1,800,000.
Bingham Co.—major structures, railroad separation, 8 mi. U. S. 91-191, $1,000,000, C. E. Aldrich, Pocatello, engr.

▲ **NEW YORK**—Dpt. P. Wks., The Gov. Alfred E. Smith State Office Bldg., Albany,
Suffolk Co.—grade crossing elimination project in Babylon, $7,500,000. CD 12/15/43.
Queens Co.—grade crossing elimination, Maspeth, $4,500,000.
grade crossing elimination, 88 St., Glendale, $600,000.
reconstr. bridge at Woodhaven Blvd., $2,500,000.

▲ **O., Cleveland**—City, Louis L. Drasler, dir., City Hall, reconstr. Warner Rd. E. 93rd St. Broadway Bridges $1,527,945, Proj. on 1958 capital imprv. program, Progress Report, Ord. 570-58. Alden E. Stilson & Assocs., 245 N. High St., Colombus, consult, engr. Jay R. Katz, City engr. CD 8/23.

▲ **OKLAHOMA-TEXAS**—Oklahoma State Hy. Dpt., Capitol Office Bldg., Oklahoma City, Okla., and Texas State Hy. Dpt., Austin, Tex.,
bridge over the Red River on U. S. 277 between Randlett, Cotton Co. Okla. and Burkburnett, Burnet Co., Tex. $1,000,000. G. H. Bittle c/o Okla. Hy. Dpt., Oklahoma City, Okla., engr. D. C. Greer c/o Texas State Hy. Dpt., Austin, Tex., engr. CD 10/25/54, under Oklahoma.

STREETS AND ROADS

† **IDAHO**—Bureau P. Rds., Dpt. Commerce, Boise,
Clearwater Co.—grading, surf. 7.3 mi. Lewis and Clark Hy., $800,000.
N. J., Fair Lawn—Borough of Fair Lawn, Borough Hall, imprv. Rte. 4, Banta Place to Plaza Rd. $122,000, Frank Peruggi, Plaza Bldg., engr.
N. J., Port Newark—Port of New York Auth., 111 8 Ave., New York 11, N. Y., imprv. entrance roadway to south side of Port Newark at interchange of Port and Terminal Sts. $139,650.
N. J., Union—Twp. of Union Municipal Bldg., 2004 Morris Ave., wid'n. paving Green Lane between Magie and Woodland Aves. $100,000. Henry Kreh, Jr., 1034 Salem Rd., owner's engr.

▲ **NEW YORK**—Dpt. P. Wks., The Gov. Alfred E. Smith State Office Bldg., Albany,
Dutchess Co.—reconstr. approx. 7 mi. Rte. 55 between Poughquag and Rte. 22 south of Pawling together with reconstr. of about 1 mi. Rte. 22. The Rte. 55 imprvt. will provide 2-lane pavement on new location with climbing lanes and Rte. 22 work will provide 4-lane concrete road mostly on present location. FAI, $1,000,000.
Jefferson Co.—reconstr. about 1 mi. Rte. 3 starting at north city line in Watertown and extending northward to just north of Rte. 11 intersection, FAI, $200,000.

▲ **NEW YORK**—Dpt. P. Wks., The Gov. Alfred E. Smith State Office Bldg., Albany,
Kings Co.—Prospect Expressway interchange at Fort Hamilton Parkway, $4,700,000.
Nassau Co.—imprvs. Conduit Blvd. between Meadowbrook Parkway and Oakland Ave., $3,100,000.
Arterial Rte. in Glen Cove, $2,200,000.
Suffolk Co.—Sunrise Hy. extension from Phyllis Dr., Patchogue to Carmans River, $5,000,000. CD 4/14/55.
Rte. 27A from Green Pond east of Sayville, $400,000 widening, resurf, Rte. 25 from Calverton to County Rd. 58, $400,000.

▲ **PENNSYLVANIA**—Pa. Hys. 506 North Office Bldg., Harrisburg,
Chester Co.—Coatesville-Downingtown By-Pass U. S. Rte. 30, 15 mi. $14,000,000. R. A. Farley, c/o owner, ch. engr. Possible bids later in 1958.
Tex., San Antonio—Bexar Co. Water Control & Imprvt. Dist. 15, co Comrs. Court, c/o Courthouse, road and street constr. $125,000 Wyatt C. Hedrick & Assocs., 5201 Fannin, Houstin, consult. engrs. CD 1/7.

▲ **WASHINGTON**—State Hy. Comn., Olympia,
Spokane Co.—limited access east-west freeway thru Spokane, along south edge of business district, distance of 3.88 mi. between Helena St. and west city limits 6 or 8 lanes wide, with 1,300 ft. bridge over Hangman Creek. $33,000,000, W. A. Bugge, state hy. dir. Constr. may start in 1962. CD 4/1/53.

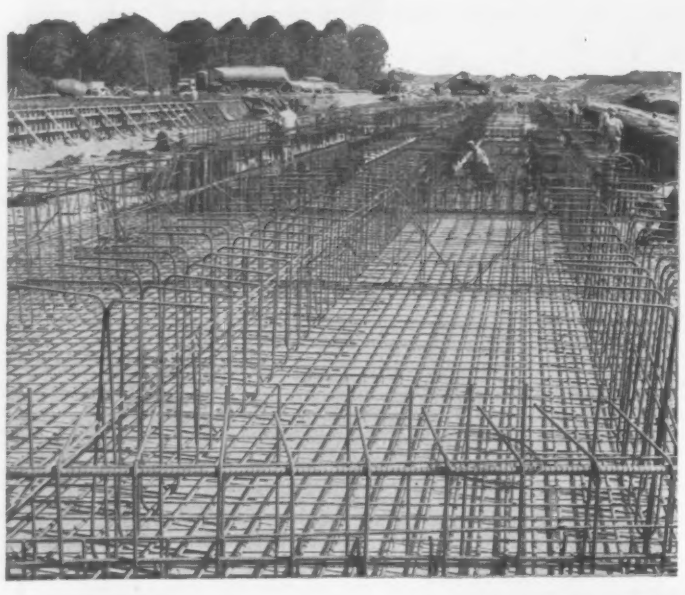
▲ **Que., Montreal**—City, City Hall, resurfacing streets, sections of Windsor-Peel, Bleury-Park, Pine, McGill, St. Antoine and Girouard. $2,000,000.

EARTHWORK, WATERWAYS

▲ **Ill., Taylorville**—City, City Hall, municipal Lake. $1,350,000. Warren & Van Praag, Inc., 253 S. Park, Decatur, consult. engr. CD 1/7/57.
Tex., Houston—Reed Roller Bit. Co., 6501 Navigation Blvd., site development, 89 acre tract Tomball and Cullen Rds. $150,000.

AIRPORTS

Colo., Pueblo—AIRPORT IMPRVS.—City, City Hall, East-West Runway, drainage, lighting and taxiways, at Memorial Airport No. 2. $830,000. $440,807. CAA funds allotted. Ken R. White, 1567 Marion St., Denver, consult. engr. CD 1/24/56.
Conn., Stratford—AIRPORT IMPRVS.—City of Bridgeport, Airport Comn., City Hall, Bridgeport, administration bldg. and control tower,. Bridgeport Airport, $750,000.
Fla., Daytona Beach—ADMINISTRATION BLDG., etc.—City, City Hall administration bldg., control tower, apron, entrance drives, parking area, etc., municipal airport, $600,000.
Ky., Louisville—TERMINAL BLDG.—Louisville & Jefferson County Air Bd., Standiford Field, Louisville, terminal bldg. addn., taxiway, Standiford Field, (municipal airport). $685,000.



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▲ **N. J., Trenton**—AIRPORT—Mercer County, Court House, expansion county airport, incl. control tower, $1,875,000. Landrum & Brown, 111 E. 4 St., Cincinnati, O., consult. engrs. CD 5/13.

O., Mansfield—AIRPORT TERMINAL—City, City Hall, airport terminal at municipal airport, $100,000. Constr. July 1959.

▲ **Ore., Portland**—AIRPORT IMPRVS.—Port of Portland, 5848 N. Lagoon Ave., Swan Island, Portland, runway and taxiway, Portland International Airport, $1,648,572. CAA allotted $900,000. Fred Yarbrough, c/o owner engr.

Wyo., Cheyenne—AIRPORT TERMINAL—City, City Hall, airport terminal bldg. $200,000, Robert W. Postin, 2838 Kelley Dr., consult. engr. CD 1/30.

PUBLIC BUILDINGS

Calif., Boron—SCHOOLS—Muroc Unified School Dist. Boron, voted bonds Mar. 4 West Boron School at Desert Lake, Junior High School and Boron Elem. School Addns. $800,000.

Calif., Burbank—CITY HALL—City, City Hall, plans by Precot & Whalley, 3514 Hyperion Ave., Los Angeles, city hall addns. $500,000.

Calif., Covina—SCHOOLS—Charter Oaks School Dist. 5427 N. Sunflower Ave., bond Election May 20, schools. $975,000.

▲ **Calif., El Segundo** — SCHOOLS — El Segundo Unif. School Dist., 203 Richmond, defeated $1,870,000 bonds Feb. 25, school constr. CD 2/11.

Calif., Larkspur—SCHOOL—Larkspur Elem. School Dist., 20 Magnolia Ave., plans by John Lyon Reid & Partners, 1019 Market St., San Francisco, elementary school. $622,285.

▲ **Calif., Los Angeles**—HOSPITAL—Bd. Supervs. Los Angeles Co., 501 Hall of Records, plans by Adrian Wilson & Assoc., 816 W. 5th St., 1 story Mira Loma Tubercular Segragation Hospital and Recalcitrant Unit Cap. Proj. 8686 $2,235,470. CD 10/16/56.

▲ **Calif., Oakland**—HOTEL—Port of Oakland, foot of Grove St., hotel near International Airport. will ask bids from private hotel operators for constr. $1,500,000.

Calif., Victorville—SCHOOL—Victor Valley High School Dist., plans by Smith, Powell & Morgridge 208 W. 8th St., Los Angeles, 750 student Junior High School at Hesperia. $750,000.

▲ **Conn., Darian**—SCHOOL—Town, Town Hall, referendum Apr. 14, on high school. $3,000,000, Fletcher-Thompson Inc., 211 State St., Bridgeport, consult. engr.-archt. CD 12/24.

Conn., East Hartford—SCHOOLS—Town, Town Hall, plans by Ebbets, Frid & Prentice, 862 Asylum Ave., Hartford, Mayberry Village School, Chester St. $600,000; May Road School, Hills St., $450,000. CD 10/7.

Conn., South Windsor—SCHOOL—Town, Bldg. Comm., Main St., plans by Kane & Fairchild, 734 Asylum Ave., Hartford, elementary school, Avery St. $605,500.

▲ **Conn., Windsor**—TOWN HALL, etc.—Town, Town Hall, Police Dpt. Headquarters, Fire Dpt. Headquarters and Town Court. $1,250,000.

Fla., Tampa—SCHOOL—Hillsboro Co. Bd. P. Instruction, Supts. Office, Court House, plans by Pullara, Bowen & Watson, 2910 Grand Central, Horace Mann Junior High School, Brandon. $450,000.

Idaho, Boise—DORMITORY—Boise Junior College, dormitory bldg. for men. $600,000.

Ill., Downers Grove—SCHOOL—School Dist. 58, 936 Warren Ave., plans by Fugard Burt Wilkinson & Orth, 520 N. Michigan Ave., Chicago, (a) Lester Memorial Grade School, 311 Lincoln St. (b) Pierce Downer Grade School addn., Grant and Oakwood (c) grade school, Blodgett Ave., Lombard. $900,000.

▲ **Ind., Wabash**—HOSPITAL—Comrs. Wabash Co. Courthouse, plans by Daggett, Naegeli & Daggett, Inc., 567 West Westfield Blvd., Indianapolis, Zone 2, hospital addn. $1,000,000.

Me., Orono—ANIMAL SCIENCE—University of Maine, Office President, Orono, plans by Crowell, Lancaster, Higgins & Webster, 6 State St., Bangor, 3 story animal science bldg. $500,000.

▲ **Mass., Holyoke**—HOUSING—City, Housing Authority, Jackson Parkway, plans by Constance F. Howes, 720 Hampden St., Holyoke, Mass., 3 story multiple units (99 units), low-rent housing, Lyman, Summer and Albion Sts. $1,000,000. Bids May-June. CD 12/6/51.

Mass., Medford — HOUSING — City, Housing Authority, 85 Salem St., plans by William H. Brown, 344 Boylston St., Boston, housing for the Elderly, (50 units) and community room. $800,000.

Mass., Methuen—HOUSING—Town, Housing Auth., Tudor St., plans by Associated Architects & Engineers, 755 Boylston St., Boston, Mass., housing for the Elderly (40 units) Oakland Ave. $650,000.

▲ **Mass., Shelburne Falls**—SCHOOL—Towns Shelburne—Buckland-Colrain-Heath-Hawley and Charlemont Bldg. Comm., 40 Church St., Shelburne Falls, plans by Warren H. Ashley, 10 North Main St., West Hartford, Conn., Mohawk Trail Regional High School. $1,750,000. Bids in April or May. CD 1/15/52.

▲ **Mich., Dearborn**—COMMUNITY COLLEGE—City, Bd. Educ., bond election May 13, Henry Ford Community College, on new campus. $4,950,000. CD 5/7/56.

▲ **Minn., Duluth**—HOUSING—Purch. & Contg. Office, 343 Fighter Group, U. S. Air Force, Municipal Airport, Duluth, plans by Melander, Fugelso & Assocs., Alworth Bldg., 240 units, duplexes and single units

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▲ **Minn., International Falls**—SCHOOL—Bd. Educ., A. C. Larson, pres., defeated $2,000,000 bonds Mar. 25, Senior High School. Melander, Fugelso & Assocs., Alworth Bldg., Duluth, Minn., archts. CD 3/14.

▲ **Minn., North St. Paul**—SCHOOL—Bd. Educ., W. G. Ruppel, clk., voted $2,500,000 bonds Mar. 25, Junior High School and addns. to existing school bldgs. CD 3/17.

▲ **Minn., Roseville (P. O. St. Paul)** — SCHOOL — Bd. Educ., Independent School Dist. No. 3, Ramsey Co., T. C. Schultz, clk., voted $3,700,000 bonds Mar. 25, SENIOR HIGH SCHOOL, new elementary school, 14-room addn. to Brimhall Elementary School, etc. CD 10/30/56.

N. J., Dunellen—SCHOOL—Bd. Educ. plans by David Ludlow, 332 Springfield Ave., Summit, Intermediate School for Class 6, 7 and 8, incl. gymnasium, $400,000.

N. J., Harrington Park—SCHOOL—Bd. Educ. plans by Emil Ciccone, 478 McBride Ave., Paterson, elementary school addn. $450,000.

▲ **N. J., Riverside (P.O. Burlington)**—HIGH SCHOOL—Regional School Dist. Twps. of Springfield, Mansfield, North Hanover and Chesterfield, Riverside, Regional Junior-Senior High School. $1,000,000.

▲ **N. J., Westfield**—SCHOOL—Bd. Educ., plans by Epple & Seaman, 901 Broad St., Newark, wing to existing high school, Rahway and Dorian Rds., $2,-500,000.

N. Y., Brooklyn—SCHOOL—Bureau Constr., Bd. Educ., 42-15 Crescent St., Long Island City, plans by Michael L. Radoslovitch, c/o owner, Proj. E-448, altering Junior High School 49, Graham and Manhattan Aves. between Maujer and Schales Sts. $350,000.

▲ **N. Y., Brooklyn**—SCHOOL—Bureau Constr., Bd. Educ., 42-15 Crescent St., Long Island City, plans by Michael L. Radoslovitch, c/o owner, Proj. E-176, P. S. 262, vicinity of Reid Ave. and Hancock St. $2,500,000.

▲ **N. Y., Long Beach**—MUNICIPAL, City, Maurice J. Fleischman, mgr., Long Beach, plans by Leonard S. Wegman, Grand Central Bldg., New York, municipal building, Proj. No. N. Y. 30-P-3012, $1,830,000. CD 12/9.

▲ **N. Y., Monticello** — SCHOOL — Central School Bd., Monticello, plans by LaPierre Litchfield & Partners, 292 Madison Ave., New York 17, N. Y., two elementary schools. $2,000,000. Bids in June. CD 12/20/56; altering elementary school, White Lake, $350,000; elementary school, Wurtsboro, $450,000.

▲ **N. Y., New York**—SCHOOL—Bureau Constr., Bd. Educ., 42-15 Crescent St., Long Island City, plans by Michael L. Radoslovitch, c/o owner, Proj. E-443, P. S. 155 in vicinity of Wagner Houses, Manhattan Boro. $2,600,000.

▲ **N. Y., New York**—SCHOOL—Bureau Constr., Bd. Educ., 42-15 Crescent St., Long Island City, plans by Michael L. Radoslovitch, c/o owner, Proj. E-284. P. S. 5 vicinity of E. 149 St. and Jackson Ave., Bronx Boro. $2,500,000.

▲ **N. Y., New York**—SCHOOL—Bureau Constr., Bd. Educ., 42-15 Crescent St., Long Island City, Proj. E-459, P. S. 154, vicinity of St. Nichols Ave. and West 126 St., Manhattan Boro. $2,600,000.

▲ **N. Y., New York**—SCHOOL—Bureau Constr., Bd. Educ., 42-15 Crescent St., Long Island City, plans by Michael L. Radoslovitch, c/o owner, Proj. E-456, P. S. 100, vicinity of Monroe Houses, Bronx Boro. $2,500,000.

▲ **N. Y., Rego Park**—SCHOOL—Bureau Constr., Bd. Educ., 42-15 Crescent St., Long Island City, Proj. E-589, addn. to P. S. 137, Witherale St. and 63 Drive, Queens Boro. $1,400,000.

N. Y., New York—HEADQUARTERS—National Maritime Union, 346 W. 17 St., National Headquarters Bldg. on west side of Seventh Ave. between 12 and 13 Sts. $750,000.

▲ **O., Canton**—CITY HALL—City, City Hall, bond election, Nov. 4, city hall, $2,700,000. Kelly & Gruzen, 80 5th Ave., New York, N. Y., archts. and Cox & Forsythe, Renkert Bldg., Canton, O., assistants. CD 12/2/52.

▲ **O., Cincinnati**—SCHOOL—Catholic Archdiocese of Cincinnati, 8th St., plans by Gartner, Holtmeier-Burdick, 3197 Linwood, High School, Montgomery Rd. $1,250,-000. Constr. late 1958 early 1959.

O., Greenhills (br. Cincinnati) — SCHOOL — Greenhills Exempted Village School Dist., Greenhills, bond election May 6, school and school addn. $593,000.

Okla., Henryetta—SCHOOL—Bd. Educ., Henryetta, Junior High School. $600,000.

Okla., Midwest City—SCHOOL—Bd. Educ., Oscar V. Rose, supt. Schools, 607 W. Richenbacker St., voted bonds Mar. 25, school expansion. $375,000. Hudgins, Thompson & Ball, 1411 Classen, Oklahoma City, archts.

Okla., Lawton—SCHOOLS—Bd. Educ., Lawton, voted bonds Mar. 25, school expansion. $550,000. Paul Harris, Gore Blvd., archt. CD 3/19.

▲ **Okla., Oklahoma City**—SCHOOLS—Bd. Educ., 900 N. Klein St., voted bonds Mar. 25, school expansion. $8,250,000. CD 3/10.

Ore., Ashland—SCIENCE CLASSROOM—State Bd. Higher Educ., University of Oregon, Eugene, Social Sciences Classroom Bldg. at Southern Oregon College, $520,000. Work may start next year.

▲ **Ore., Corvallis**—ENGINEERING—State Bd. Higher Educ., University of Oregon, Eugene, Mechanical Engineering Bldg., Oregon State College. $1,055,000. CD 4/13/54.

▲ **Ore., Eugene**—SCIENCE—State Bd. Higher Educ., University of Oregon, Eugene, 1st unit, Science Bldg., University of Oregon. $1,315,000.

Pa., California—LIBRARY—General State Auth, 18th and Herr St., Harrisburg, library bldg. for California Pa. State Teachers College, $520,000. A. F. Jones, c/o owner, ch. engr.

Pa., Folsom—SCHOOL—Ridley Twp. School Dist. plans by Joseph F. Wigmore, 117 S. 17th St., Phila., Grace Park Elem. School addn. $350,000. CD 3/8/56.

Pa., Fort Washington—SCHOOL—Upper Dublin Twp. Bd. Educ., Fort Washington, plans by John S. Carver, 2112 Spruce St., Phila., high school. $750,000. Robert E. McLaughlin, 1411 Walnut St., Phila., consult. engr. CD 5/8.

▲ **Pa., Gibsonia**—SCHOOL—Pine Twp. School Dist. R. D. No. 1, Gibsonia, plans by Atlenhof & Bacon, Park Bldg., Pittsburgh, Junior High School, Warrendale. $1,000,000.

▲ **Pa., New Florence**—SCHOOL—Laurel Valley Jt. School Dist., and State Pa. School Auth., 101 S. 25th St., Harrisburg, plans by Sorber & Hoone, 711 1st National Bank Bldg., Greensburg, Junior Senior High School, 14 classrooms, 4 science, 2 commercial shop, health, etc. $1,500,000.

Pa., Norwood—SCHOOL—Norwood Pa. Boro School Dist., plans by George M. Ewing Co., Western Savings Fund Bldg., Phila., Seneca Ave. School Addn. $350,000.

Pa., Paoli — SCHOOL — Paoli Area High School Sys., Berwyn, plans by Howell Lewis Shay & Assocs., Packard Bldg., 15th and Chestnut Sts., Phila., Conestoga High School Addn. $344,000 Keast & Hood, 2031 Chestnut St., Phila., engrs.

▲ **Pa., Phila**—School—Bd. Educ., 21st and Winter Sts., plans completed by Heacock & Platt, 1505 Race St., Roxborough High School Addn. $1,500,000. Allabach & Rennis, 16 S. Broad St., Phila., Pa., consult. engrs. CD 5/27.

Pa., Phila.—SCHOOL—Bd. Educ., 21st and Parkway, plans by David Supowitz & Assocs., 246 S. 15th St., Octavius Goddo Elementary School, 42nd and Ludlow Sts. $500,000.

Pa., Punxsutawney—SCHOOL—Pa. P. School Bldg. Auth., 101 S. 25th St., Harrisburg, school for Punxsutawney Area Jt. School Bd. (Proj. 765-616). $634,410.

Tenn., Knoxville—SCHOOL—Knox County Bd. Educ., c/o Supt., 400 Hill Ave. SW, Consolidated School. $350,-000. Hopkins Bailey, c/o owner, engr.

▲ **Tex., McAllen**—HOSPITAL—City, City Hall, plans by R. Newell Waters & Assocs., 1st National Bank Bldg., Weslaco, 100 bed city hospital. $1,000,000. Reynolds & Morgan, 1003 Ind. Bldg., and Karbach & Engel, 909 Maverick Bldg., San Antonio consult. engrs. CD 10/24.

Tex., Mesquite—SCHOOLS—Mesquite Ind. School Dist., elementary school, $375,000, CD 5/15; high school, $450,000; stadium-athletic grounds, $150,000.

Tex., Odessa—SCHOOL—Ector County Ind. School Dist. school addn. $495,000.

▲ **Tex., Palestine**—SCHOOL—Palestine Ind. School Dist., high school $1,000,000; elementary school $650,000; school addns. $350,000; playgrounds, athletic courts, etc. $75,000.

▲ **Tex., Port Neches**—SCHOOL—Port Neches Ind. School Dist., 1000 Merriman St., plans by Caudill, Rowlett, Scott & Assocs. 425 S. Main St., Bryan, Junior High School, Groves. $1,250,000. CD 10/9/56.

▲ **Tex., Waco**—APARTMENTS—Housing Auth. of Waco, Box 987, Dwell Naylor, exec., plans by Wm. N. MacPherson & Edwin F. Redondo, Assoc. Archts., 114 Princess Pass, San Antonio, 45 bldgs. containing 250 apartments, Tex. 10-4, $3,000,000; 36 dwellings units Tex. 10-7 $1,000,000. R. Marvin Shipman, 202 W. Olmos Dr., San Antonio, and Wm. K. Hall, Melba Bldg., Dallas, Tex., consult. engrs. Expect bids June 1958 or 2nd ½ of 1958. CD 9/19/56.

Tex., Wink—SCHOOL—Winkler Ind. School Dist. plans by Atcheson, Atkinson & Fox, Sanford Bldg., Lubbock, elementary school. $350,000. CD 2/17.

▲ **Utah, Logan**—FORESTRY—Utah State Bldg. Bd., 419 State Capitol, Salt Lake City, plans by Fred L. Markham, 45 N. University, Provo, forestry bldg. at State University. $2,250,000. CD 12/6/56.

Utah, Salt Lake City—SCHOOL—Bd. Educ., 440 E. 1st St., plans by Bruce J. McDermott, 366 S. 5th E., elementary school to replace Franklin School which is to be razed to make way for new freeway. $400,000. CD 5/2/56.

▲ **Va., Norfolk**—PUBLIC SAFETY—City, City Hall, Plume St., plans by Vincent G. Kling, 917 Corinthian Ave., Phila. Pa., and Oliver & Smith, 333 W. Freemason St., 8 story public safety bldg. $4,000,000. CD 3/15/54.

▲ **Wash., Renton**—DWELLINGS—Renton Housing Auth. plans by G. W. Stoddard-Huggard & Assocs., 1120 Harvard Ave., Seattle, Zone 2, one hundred 1 and 2 story low-rent dwelling units. $1,000,000. CD 1/2.

Wash., Seattle—APARTMENT—University of Washington, Seattle, Zone 5, plans by Bassetti & Morse, Tower Bldg., Zone 1, 40-family apartment unit to house married internes and residents of University Hospital, $440,000. CD 3/14.

Wash., Seattle—BUSINESS ADMINISTRATION—University of Washington, Seattle, Zone 5, plans by Decker, Christensen & Kitchin, 1411 4 Ave. Bldg., Zone 1, business administration bldg. $700,000. CD 12/24.

Wash., Seattle—STATE MUSEUM—University of Washington, Seattle, Zone 5, plans by J. J. Chiarelli, 2nd and Cherry Bldg., Zone 4, bldg. to house Washington State Museum $600,000. CD 2/9/55.

Ont., Galt—MUNICIPAL AND POLICE—City, City Hall, municipal and police bldg. $400,000.

▲ **Que., Montreal**—SCHOOL—Montreal Catholic School Comm., 3737 Sherbrooke St. E., plans by Gerard Notebaert, 3460 Jeanne d'Arc Ave., Apt. 1, 2 story, bsmnt., rein.-con. frame, brick high school, concrete fdn. Papineau Ave., Auriol, Sauve and Cartier Sts., $1,500,000. Lalonde & Valois, 615 Belmont Ave., consult. engrs. CD 10/23/56.

COMMERCIAL BUILDINGS

▲ **Calif., Palo Alto**—CLINICAL SCIENCE, etc.—Stanford University, Bd. Trustees of Leland Stanford Junior University, Encina Hall, plans by Edward D. Stone, 635 Bryant St., 2nd phase medical center, clinical science bldg. anatomy and medical bldg., etc. School of Medicine. $14,000,000. Wagner & Martinez, 181 S. Park St., San Francisco, mgrs. for entire project.

▲ **Calif., San Diego**—DEPARTMENT STORE—May Co. Dpt. Stores, Morton D. May, pres., Railway Exchange Bldg., 611 Olive St., St. Louis, Mo. plans by Albert C. Martin & Assocs. 210 W. 7th St., Los Angeles 3 story, bsmnt. rein-con. department store bldg. north of Hy. 80 between Hy. 395 and Texas St. $15,000,000 CD 10/17.

Calif., Sunnyvale—HOME FOR AGED—California Dist. Evangelical Lutheran Church, c/o Nielsen & Moffat, archts., 4072 Crenshaw Blvd., Los Angeles, frame stucco Home for Aged. $750,000.

Conn., Hartford—MEDICAL BLDG.—Samuel I. Ward, et al c/o M. J. Neiditz & Co., Inc., 37 Lewis St., Hartford, plans by Rossetti, DiCorcia & Mileto, 185 Main St., Bristol, 4 story penthouse, 60 x 128 ft. rein.-con. brick and panel ext. with aluminum frames, 40 suites, laboratory facilities, Medical Bldg. "Woodland Medical Center", 140 Woodland St., $500,000. A. John Macchi, 57 Farmington Ave., consult. engrs.

▲ **Conn., New Haven**—APARTMENT—University Towers, Inc., c/o Kahn & Jacobs, archts., 2 Park Ave., New York, N. Y., three 16 story, apartments (750-apts.) Oak St. Redevelopment area, $8,500,000.

Del., Wilmington — CHURCH, etc. — First Unitarian Church, 807 West St., plans by Whiteside Moeckel & Carbonell, 909 Tatnall St., Church and Sunday School. $350,000. CD 5/27.

Fla., Bal Harbor—HOTEL—Royal American, Inc., 10101 Collins Ave., plans by Roy F. France & Son, 1620 West Ave., Miami Beach, 6 story, 35 x 166 RIC concrete piling about 50-rooms, Bal Harbor Hotel Addn., 10101 Collins Ave. $350,000. H. J. Ross & Assocs., 1735 Biscayne Blvd., Miami, struct. engrs. John K. Sasnett, 561 NE 79th St., Miami, elect. and Mech. engr.

▲ **Fla., Miami**—HOSPITAL—Miami Baptist Hospital, Inc., Dr. C. Roy Angell, chn., 500 N E 1st St., plans by Sherlock, Smith & Adams, 303 Washington Ave., Box 973, Montgomery, Ala., hospital, North Kendall Dr. and SW 88th Ave. $3,000,000. Bids in late summer 1958.

▲ **Minn., Edina (P.O. Minneapolis)**—OFFICE BLDGS., etc.—Southdale Realty Co., 3500 West 66 St., R. Crabb, ex. vice pres., Edina, plans by Thorshov & Cerny, 400 Metropolitan Bldg., Minneapolis, office bldgs. and motel between France Ave., West 66 St., Valley View Rd. and West 64 St. $10,000,000.

▲ **Minn., Minneapolis**—OFFICE—J. K. Weiser, 1619 Hennepin Ave., plans by S. C. Smiley & Assocs., 1750 Hennepin Ave., 2½ story, about 150,000 sq. ft. office bldg., Wayzata Blvd. at Penn Ave. South. $3,000,000.

▲ **Mo., Kansas City**—OFFICE—Jacob Gershon & Assoc., 6400 Cherry, Kansas City, Mo., plans by Geis-Hunter-Ramos, 7920 State Line, Kansas City, Mo., 20 story, office, 2 lower floors parking for tenants with an adjacent parking garage of 10-12 floors with mechanical lifts. $3,500,000.

N. J., Glassboro—SHOPPING CENTER, etc.—Owner, c/o Nelson E. Bauzenberger, archt., 341 Park Ave., Collingswood, shopping center and parking area, Delsea Dr., $500,000, Bids soon.

N. J., Harrington Park—SCHOOL—Archdiocese of Newark, 333 Mulberry St., Newark, and Parish Lady of Victories, Lynn St., Harrington Park, school, Lynn St. $345,000.

N. J., Hillside—YOUTH CENTER—Siani Congregation, Clark St. and Maple Ave., plans by George Levy, 1147 E. Jersey St., Elizabeth, youth center, Clark St. and Maple Ave. $350,000.

N. J., Lindenwold—CHURCH—St. Lawrence Catholic Church plans by Thomas Henry Moran, 549 Jefferson Rd., Princeton, church, $344,000.

N. J., Pennsauken—PAROCHIAL SCHOOL—Roman Catholic Diocese, Camden, plans by Faint & D'Anastasio, 5521 Westfield Ave., parochial school, St. Cecilia's Parish. $344,000. Bids soon.

▲ **N. J., Princeton**—DORMITORY AND DINING HALL—Princeton University plans by Sherwood, Mills & Smith, 65 Broad St., Stamford, Conn., 2 units dormitory and dining quadrangle. $3,000,000. CD 2/26.

N. Y., Albany—DORMITORY, etc.—College of St. Rose, Sister Mary de Lourdes, bus. mgr., Madison and Western Aves., plans by Edward J. Toole, 283 Washington Ave., Albany, N. Y., 5 story dormitory and 1 story lounge wing, Proj. N. Y. 30-CH-69 (D). $990,000. CD 4/1.

N. Y., Brooklyn—NURSING HOME—Lester J. Dworman, 400 Park Ave., New York, Zone 17, plans by Wechsler & Schimenti, 118 E. 25 St., New York, Zone 10, 3 story nursing home, 719 Linden Blvd. $350,000.

▲ **N. Y., Brooklyn**—APARTMENT—Park Plaza Apartments Inc., 16 Court St., Zone 2, plans by Morris B. Adler, 16 Court St., Zone 2, 15 story apartment for

(Continued on page 164)

If operator inadvertently fires new Remington Captive Stud Tool into inadequate base material—

Captive Stud Guard Assembly prevents free flight of stud which is locked to tool during firing.

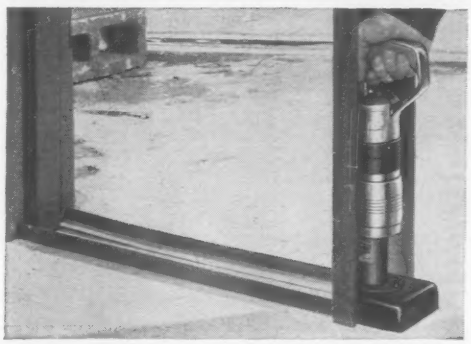
Safest Stud Driver Ever Designed!

Remington Stud Driver...with Model 440 Captive Stud Guard Assembly

Power, efficiency, speed *and safety* are features of the new Remington Stud Driver with Captive Stud Guard Assembly. It's designed to prevent free flight of studs through a working surface... permitting use of the tool in a whole new range of fastening situations.

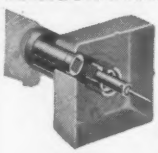
Just squeeze the trigger to anchor wood or metal sections to concrete or steel with ¼" diameter Remington Studs. Scientifically graded 22 caliber Power Loads furnish *exact* driving force you need to do the work. No pre-drilling, no outside connections required!

What's more, you can choose from a *complete* selection of ¼" diameter Remington "Power-Guide" Studs. And for particular applications involving repetitive use, you may prefer one of 15 special-purpose guards to adapt the versatile Stud Driver to *your* job requirement!



ONLY SECONDS are required to anchor metal door frames to concrete floors with this *new* Stud Driver! You can take the tool anywhere, use it anywhere for all your light, medium and heavy-duty fastening jobs.

Exclusive Remington Captive Stud Guard Assembly has new "*Safety-Zone*"



Heart of the Captive Stud Assembly is combination of square-headed piston and aluminum alloy buffer. Piston is abruptly halted by buffer when base material is inadequate to stop the stud. Remember: If it's the Remington Captive Stud tool, it's the safest Stud Driver on the market!

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STUD DRIVER

Remington Arms Company, Inc., Bridgeport 2, Connecticut

Mail coupon for free booklets

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Please send information about the new Remington Stud Driver and Model 440 Captive Stud Guard Assembly.

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Firm.....*Position*.....

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City.....*State*.....

(Continued from page 162)

134 families and 40 car garage, 2-10 Plaza St. $1,000,000.

N. Y., Brooklyn—APARTMENT—Tire Management Corp., 44 Court St., Zone 2, plans by Philip Birnbaum, 12 E. 48 St., New York, Zone 17, 6 story apartment with 67 apartments and 48 car garage, 1829 Caton Ave. $500,000.

N. Y., New York—APARTMENT—Albert & Harrison, Inc., 15 E. 48 St., Zone 17, plans by Leo Stillman, 332 E. 149 St., Zone 51, 7 story apartment, southeast corner of 17 St. and 3 Ave. Owner changed. $400,000. CD 6/28/55.

N. Y., New York—APARTMENT—Deauville Constr. Co., A. Leibman, pres., 2180 Ryer Ave., Zone 57, 7 story apartment for 58 families on west side of Briggs Ave. south of Bedford Park Blvd., Bronx Boro. $500,000.

N. Y., New York—HOSPITAL—Jewish Memorial Hospital, Broadway and 196 St., hospital addn. to provide 25 beds and other facilities, $500,000.

▲ **N. Y., New York**—APARTMENT—Henry Kibel, c/o George G. Miller, archt., 125 W. 45 St., Zone 19, 20 story apartment for 200 families, East 51 St. and Second Ave. $1,500,000.

N. Y., New York—APARTMENT—Irving & Hyman Shapiro, 650 Whittier St., Zone 59, plans by H. Herbert Lilien, 201 W. 72 St., Zone 23, 6 story apartment, west side of Broadway between Whalen St. and Forster Place, Bronx Boro. $550,000.

N. Y., Rockville Center—CHANCERY—Diocese of Rockville Center, P. O. Box 120, plans by LaPierre, Litchfield & Partners, 292 Madison Ave., New York, Zone 17, chancery bldg. $350,000.

N. Y., Schenectady—DORMITORY—Union College, Hale House, Schenectady, plans by McKim, Mead, White, 101 Park Ave., New York, dormitory. $600,000.

▲ **O., Bedford Heights**—HOUSING—Darden Builders, 20100 Kinsman St., Cleveland, 226 homes on 84 acre site east of Barlett Rd. $3,500,000.

▲ **O., Cleveland**—RADIOLOGY—St. Luke's Hospital, 11311 Shaker Blvd., Zone 4, plans by The Ellerbe Co., E. First National Bank Bldg., St. Paul, Minn., 1 story bsmnt. Radiology Bldg. $1,300,000.

O., Cleveland—HOSPITAL—Women's Hospital, 1940 E. 101st St., Zone 6, plans by The Ellerbe Co., E. First National Bank Bldg., St. Paul, Minn., 2 story hospital addn. $675,000.

▲ **O., Cleveland Heights**—APARTMENTS—Kenilworth Estates Inc., 3134 Euclid Ave., Cleveland, Zone 15, Plans by Heine, Crider & Williamson, 105 Front St., Berea, 200-suite apartment development on N. Side Euclid Heights Blvd. $4,000,000. CD 12/11.

▲ **O., Toledo**—FEDERAL OFFICE—General Services Admin., General Services Bldg., 19th and F Sts. N.W., Wash. 25, D. C., federal office bldg., Madison Ave. Water and Summit Sts., (lease-purchase). $4,950,000. CD 10/2/56.

Pa., Devon—OFFICE, etc.—George H. Pratt, 101 Charles Dr., Bryn Mawr, office bldg. and bowling alleys. $750,000.

Pa., Easton—CHURCH—Good Sheperd Lutheran Church, 2011 Hay Terrace, plans by T. Norman Mansell, 1831 Chestnut St., Phila., church. $350,000.

Pa., Evansburg—SUPERMARKET—Larry Tornetta, 813 DeKalb St., Norristown, plans by William Dean Faint, 1915 Browning Rd., Pennsauken, N. J., supermarket. $344,000.

Pa. Media—SHOPS—Williamson Free School of Mechanical Trades, plans by Massena & DuPont, 704 Delaware Ave., Wilmington, Del., 5 shop bldgs. $500,000. Lambert McGee & Costello, 16290 Chestnut St., Phila. engrs. CD 11/20.

Pa., Norristown—OFFICE—Owner, c/o Keystone Assocs., consult. engrs.-archts., 419 S. 46th St., Phila., office bldg., Marshall, DeKalb, Maris Sts. $344,000.

Pa., Phila.—NURSES RESIDENCE—Pennsylvania Hospital, 111 N. 49th St., 4 story student nurses residence, $525,000. CD 11/28/45.

Pa., Phila—AUDITORIUM, etc.—Rhawnhurst Jewish Center, 5918 N. Broad St., plans by Simon M. Langberg, 1202 Tyson Ave., auditorium and educational bldg. $344,000.

Pa., Pittsburgh—APARTMENT—Stanley M. Taxey, 814 Penn Ave., plans by Arthur Tennyson, 666 Washington Rd., 8 story, bsmnt., steel apartment, 4920 Center Ave. $500,000.

S. D., Sioux Falls—COUNTRY CLUB, ect.—Cactus Hills Corp., c/o Evan Lucas, archt., 214 Gas Co. Bldg., 30x11 ft. country club, 40 ft. x 70 ft. swimming pool, 27 hole golf course. $500,000. Tom Searles, mgr., Sioux Falls, S. D.

▲ **Tex., Dallas**—DWELLINGS—Centex Constr. Co., 4606 Greenville, 38 dwellings $378,150; 28 dwellings $349,175; 30 dwellings $358,000; 34 dwellings $369,500.

▲ **Tex., Dallas**—TRADE MART—Trammell Crow & Assocs., 425 S. Field St., plans by Harold A. Berry & Donald Speck, 425 S. Field St., 4 story, 1,000,000 sq. ft. masonry Trade Mart, $18,000,000; hard paved parking area for 6,000 cars, $250,000; site preparation, $450,000, in area off Stemmons Expressway.

Tex., Farmers Branch—SHOPPING CENTER—W. L. Earnhart, 4519 San Gabriel, Dallas, 30 acre shopping center. $750,000-$1,000,000.

▲ **Tex., Houston**—COURTHOUSE, etc.—General Services Admin., F St. between 18th and 19th Sts. N.W., Wash. 25, D. C., plans by Rustay & Martin, 1811 Crawford St., Staub, Rather & Howze, 2814 Virginia St., and Harvin C. Moore, 2006 W. Alabama St., 12-15 story federal courthouse and office (lease-purchase). Rusk, Brazos Capitol and Smith Sts. $15,300,000. CD 3/6, under Public Bldgs.

Tex., Lubbock—MOTEL, etc.—Joe Stewart, 2626 30th St., motel and facilities. $350,000.

▲ **Tex., Odessa**—OFFICE—Professional Tower of Odessa, Inc., Dr. Vance L. Elliott, pres., plans by W. W. Millburn, Jr., 603 Jessie St., Austin, Zone 4, 10 story office. $1,500,000.

▲ **Tex., San Antonio**—DWELLINGS—T. Brooks Wood & H. D. Store, 603 Storeywood, 28 dwellings $359,000; 32 dwellings $371,125; 26 dwellings $348,100, in Dellview Area subdivision.

Tex., San Antonio—ACTIVITIES—Grace Lutheran Church, 4002 Broadway, plans by Ed Nicholson, 1102 Basse Rd., activities. $500,000. Marvin R. Shipman, 202 Olmos Dr. West, and Halsey & Royer, 120 W. Grayson San Antonio, Tex., consult. engrs. CD 3/19.

Tex., Seguin—GLASSROOMS—Texas Lutheran College, Ed. Sagebeil, pres. Classrooms Bldg. No. 1 $425,000; Classrooms Bldg. No. 2 $350,000; science $400,000; administration $350,000.

▲ **Utah, Ogden**—BANK—Commercial Security Bank, Robt. Hemingway, pres, 2453 Wash. Blvd., Ogden, plans by Hodgson & Holbrook, 807 Eccles Bldg. bank bldg., 25th and Washington, $1,000,000 Present bldgs. being razed in near future. CD 10/18/56.

▲ **Wash., Mountlake Terrace** — HOUSES — A. Balch Community Bldrs., 8050 35 Ave. N.E., Seattle, 130 houses in Cedar Grove area. $1,300,000.

Wash., Seattle—APARTMENT—Valley Associates, c/o S. G. Morrison, archt., Jones Bldg., Zone 1, 3 story, part bsmnt. 116 x 138 ft. apartment with rein-con. garage, 800 Queen Anne Ave. $600,000.

INDUSTRIAL BUILDINGS

Conn., Milford—SERVICE STATION, etc.—Secondi Bros., 209 Boston Post Rd., plans by Howard Perry, 7 River St., service station and motel, 22 units, 2-Bay service station, Old Gate Lane. $100,000.

Conn., Orange — MAINTENANCE SHOP — Adley Express Co., 216 Crown St., New Haven, plans by Leo F. Caproni, 132 Temple St., New Haven, 1 story, 150x500 ft., brick, steel, Maintenance Shop, Bull Hill Lane, $800,000.

▲ **Fla., Umatilla**—PLANT—Grand Island Citrus Cooperative, R. D. Flippo, pres., Eustis, concentrate plant with feed mill and cold storage warehouse. $1,250,000.

Ill., Chicago—FACTORY—Williamson Candy Co., 4701 W. Armitage Ave., plans by Arthur Benson, 332 S. Michigan Ave., 1 story brick, 9,000 sq. ft. factory addn. $100,000.

Ind., Marion—WAREHOUSE, etc.—Paranite Wire & Cable Div. of Essex Wire Corp., 2601 S. Adams St., part 2 story (70,000 sq. ft.), 274x421 ft. masonry, structural steel addn. to present warehouse and mfg. bldg. $789,300. Robert O. Weisz, 1601 Wall St., Fort Wayne, consult. engr. CD 10/16/45.

N. J., Whippany—LABORATORY—Western Electric Co., 195 Broadway, New York, N. Y., 50,000 sq. ft. addn. to laboratory in Whippany Rd. for Bell Laboratories, Hanover Twp. $500,000.

N. Y., Brooklyn—FACTORY—Charles Industrial Builders, Inc., 2145 E. 21 St., plans by S. Gardstein & Son, 50 Court St., Zone 2, 1 story factory, 1019-39 E. 46 St., $100,000.

N. Y., Brooklyn—WAREHOUSE—Duclay Realty Corp., 16 E. 34 St., New York, Zone 16, warehouse and material handling sys., 49 Dupont St. $220,000. Frederick C. Lowy, 259 W. 14 St., New York, Zone 11, consult. engr.

N. Y., Buffalo—PLANT—Jamestown Manufacturing Co., 40 Pearl St., 1 story, 15,000 sq. ft. brick furniture manufacturing plant and showroom. $100,000.

N. Y., New York—GARAGE, etc.—1051 Fifth Ave., Inc., 332 E. 149 St., Zone 51, plans by Wechsler & Schimenti, 118 E. 25 St., Zone 10, 45 car garage and office bldg., 1050 Fifth Ave., $110,000.

▲ **O., Lockland** — INDUSTRIAL DEVELOPMENT — Owner c/o P. G. Graves, 806 Main St., Cincinnati, industrial development, Anthony Wayne Ave. $15,000,000.

Ore., Milwaukie—WAREHOUSE—United Grocers, Inc., 6433 SE Lake Rd., 40,000 sq. ft. warehouse addn. $200,000-$300,000. Leslie Poole, Royal Bldg., Portland, consult. engr. Bids soon as plans are completed.

Tex., Greggton—WAREHOUSE—Industrial Steel Warehouse Co., Greggton, warehouse. $100,000.

Tex., Greggton—WAREHOUSE, etc.—Texas Scrap Material Co., Longview, warehouse and yards $275,000.

▲ **Tex., Houston**—PLANT—Alco Products, Inc., c/o Fidelity Union Life Bldg., heat exchanger plant 107 acre tract Almeda-Riley Rds. Approx. $5,000,000.

▲ **Tex., Houston**—PLANT—Maxwell House Div. General Foods Corp., 3900 Harrisburg, 8 story process plant. $2,000,000. CD 4/26/57.

Tex., Houston—WAREHOUSE—Texberry Container Corp., c/o Brooks & Brooks, archts., 1901 Whitney St., 20,520 sq. ft. warehouse. $200,000. Ernest L. Vogt, 2712 Danville and Jerold L. Davis & Assocs., 3400 Montrose Blvd., consult. engrs. CD 11/12.

Tex., Longview — PLANT — Lebus International Engineers, Inc., Longview, plant addn. (3rd unit) $200,000.

Tex., Lubbock — WAREHOUSE — Stinger Constr. Co., 718 E. Yale, 102,052 sq. ft. warehouse $100,000.

▲ **Utah, Salt Lake City** — PLANT, etc. — Sperry-Utah Engineering Laboratory, Div. Sperry-Rand Corp., 322 N. 21st W., plans by Paul K. Evans, 515 E. Broadway, 87,500 sq. ft. addn. to guided missile mfg. plant, 2 story, 60,000 sq. ft. office bldg. $2,000,000.

Wash., Mountlake Terrace—PLANT—J. Fluke Mfg. Co., Inc., 1111 W. Nickerson St., Seattle, electronic equipment mfg. plant. $175,000.

Wis., Green Bay—WAREHOUSE, etc.—Green Bay Box Co., 831 Doblon St., plans by John Sommerville Assocs., 403 W. Walnut St., 160 x 280 ft. concrete, steel, brick blocks and metal panels warehouse addn., 40 x 135 ft. truck loading dock. $500,000.

▲ **Wis., West Allis**—PLANT—Borden Co., 620 N. 8 St., Milwaukee, Zone 3, plans by Cowell & Robinson, 25 W. 43 St., New York 36, N. Y., fluid milk and ice cream plant. $3,000,000. CD 2/14/57.

Wyo., Casper—PLANT—General American Transportation Co., c/o Mrs. Edness Wilkins, Kimball Ranch, railroad tank car manufacturing plant to be located at Kimball Ranch along Chicago & Northwestern R.R. $200,000.

▲ **Ont., Elliot Lake**—PLANT—Rio-Tinto-Dow, c/o Rio-Tinto Mining Co. of Conada Ltd., 335 Bay St., Toronto, chemical plant in connection with uranium mining, $1,000,000.

UNCLASSIFIED

Calif., Los Angeles—RECREATION BLDG.—Bd. Supervs., Los Angeles Co., 501 Hall Records, plans by Aln & Garrot, 2311 Hyperion Ave., 1200, 2070 and 1200 sq. ft. recreation bldgs. at Victoria, Bel Aire and Bodger Parks. $127,000.

Conn., Manchester—STREET LIGHTING—Town, Town Hall, improve street lighting, incl. Center St. from East Middle Turnpike to Bolton Town Line, $240,000.

† **D. C. Wash.**—NAVAL IMPRVS.—Officer in Charge of Constr., Potomac River Naval Command, U. S. Gun Factory, Wash., Zone 25, plans by John G. Loehler, archts.-engr., 726 Jackson Place N.W., rehabilitation of bldgs. at Naval Security Station, 3801 Nebraska Ave. NBy 12959.

▲ **Mo., Creve Coeur (St. Louis 24 P.O.)**—ICE SKATING RINK—Sports Palace, Inc., E. C. Behring, Jr., 4 Covington Lane, Olivette 14, Mo., 180x360 ft. ice skating rink and related facilities on 14 acre site at Lindbergh Blvd. and Olive St. Road. Over $1,000,000.

N. J., Trenton—PARKING LOT—Trenton, N. J. Parking Auth., 28 W. State St., parking lot, 100 block N. Warren St. $160,000. Louis S. Kaplan, 143 East State St., consult. engr. CD 1/8.

▲ **N. Y., Brooklyn**—PIER—Dpt. Marine & Aviation, Pier A, North River, New York, Zone 4, Proj. D-265, superstructure for 35 St. Pier, Gowanus Bay, $1,880,000; Contr. 3046-Proj. D-265, reconstr. substructure of 35 St. Pier, Gowanus Bay. $1,675,000. Frederic R. Harris, Inc., 27 William St., New York, N. Y., engr. CD 6/11.

N. Y., Buffalo—GENERATOR—Bd. Supervs. Erie Co., County Hall, Zone 2, emergency power generator for Children's Hospital. $130,000.

N. Y., Buffalo—GENERATOR—Bd. Supervs. Erie Co., County Hall, Zone 2, emergency power generator for Meyer Memorial Hospital. $178,000. CD 5/18/56, under Public Buildings.

Oregon—SALMON HATCHERY—Oregon Fish Comn., State Office Bldg., Portland, salmon hatchery, near Port Orford, Curry Co. $200,000.

Pa., Brookhaven—SWIMMING POOL, etc.—Brookhaven Pa. Swim Club, 3417 Commerce Ave., swimming pool, bathhouse, snack bar, filter plant, fencing and paving. $150,000.

Pa., Phila.—PLAYGROUND—Dpt. Procurement, City Hall Annex, plans by Norman N. Rice, 2400 Pine St., Happy Hollow Playground and gym, over $73,000, Dorfman Bloom, 1411 Walnut St., consult. engr.; plans by Montgomery & Bishop, 138 N. 17th St., Scanlon Playground K and Tioga Sts., over $73,000. CD 2/3/57.

Pa., Phila.—SUBWAY STATION—Dpt. Procurement, City Hall Annex, plans by Costello & Orefice, archts.-engrs., 843 N. 19th St., 15th St. subway station rehabilitation. $250,000. CD 3/25/57.

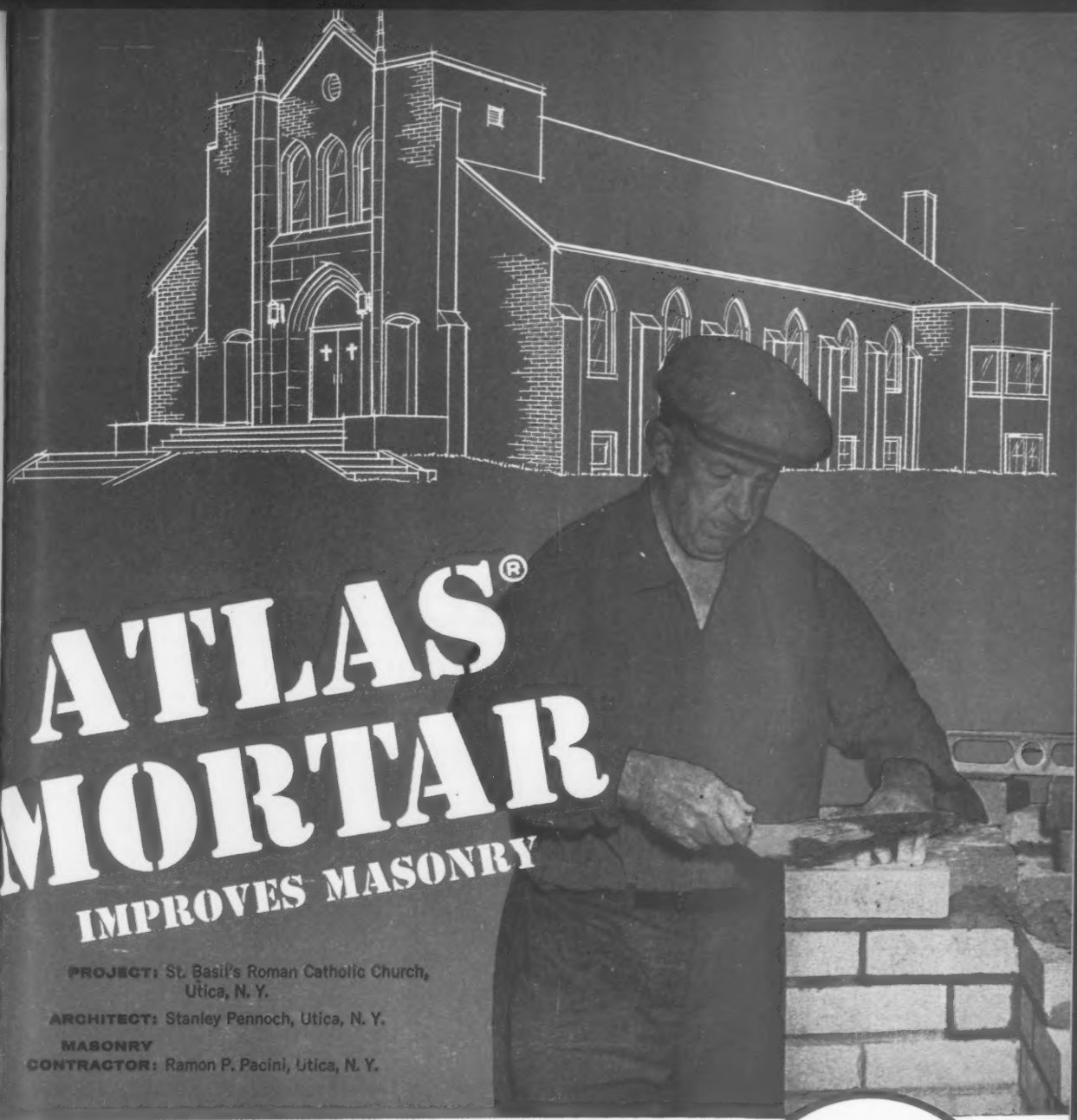
Texas—TELEPHONE LINES—Caldwell County Telephone Co., Martindale, pole telephone lines; service sys. imprvs., Milano, $226,000.

Texas—RURAL DISTRIBUTION LINES—Byers-Petrolia Telephone Co., Inc., Byers, rural pole lines, sys. imprvs. in Clay Co. $216,000.

† **Wisconsin-Minnesota**—NIKE INSTALLATIONS—U. S. Eng, 1217 U. S. Post Office & Custom House, St. Paul 1, Minn., plans by Toltz, King, Duvall, Anderson & Assoc., Inc., Pioneer Bldg., St. Paul 1, Minn., preparation of contract plans and specs. for 4 Nike installations, River Falls, Wis., and Farmington, St. Bonifacius and Bethel, Minn.

Wis., Eau Claire — TRANSMISSION LINES — Northern State Power Co. of Wisconsin, 2 S. Barstow St., subsidiary of Northern States Power Co. of Minnesota, 15 South Fifth St., Minneapolis, Minn., rebuild remaining 35 mi. of Oak Park-Wissota 115 KV transmission line. $305,000. Work scheduled for next year.

Que., Sept Isles—SWIMMING POOL—Centre Recreatif de Sept Isles, Inc., Sept Isles, swimming pool to adjoin new gym-auditorium Bldg., 60 x 112 ft., pool, 42 x 75 ft., 3 to 9 feet deep, $130,000. Parent-Moranville, Edifice Caisse Populaire, Hauterive, Que., consult. engrs.



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IMPROVES MASONRY

PROJECT: St. Basil's Roman Catholic Church, Utica, N. Y.

ARCHITECT: Stanley Pennoch, Utica, N. Y.

MASONRY CONTRACTOR: Ramon P. Pacini, Utica, N. Y.

"... holds its temper ... extra-smooth and easy to work,"
says Alfred Helland, Masonry Foreman

- To produce serviceable masonry walls, the mortar mix must be plastic — and retain its mixing water.
- Masons on the job consistently confirm that mixes made with ATLAS MORTAR cement strongly resist the suction of porous masonry units. This *water-retention* increases bond strength.
- Quality-controlled manufacture of ATLAS MORTAR masonry cement maintains high product standards, assuring uniform performance and appearance on every project. *(Complies with ASTM and Federal Specifications.)*

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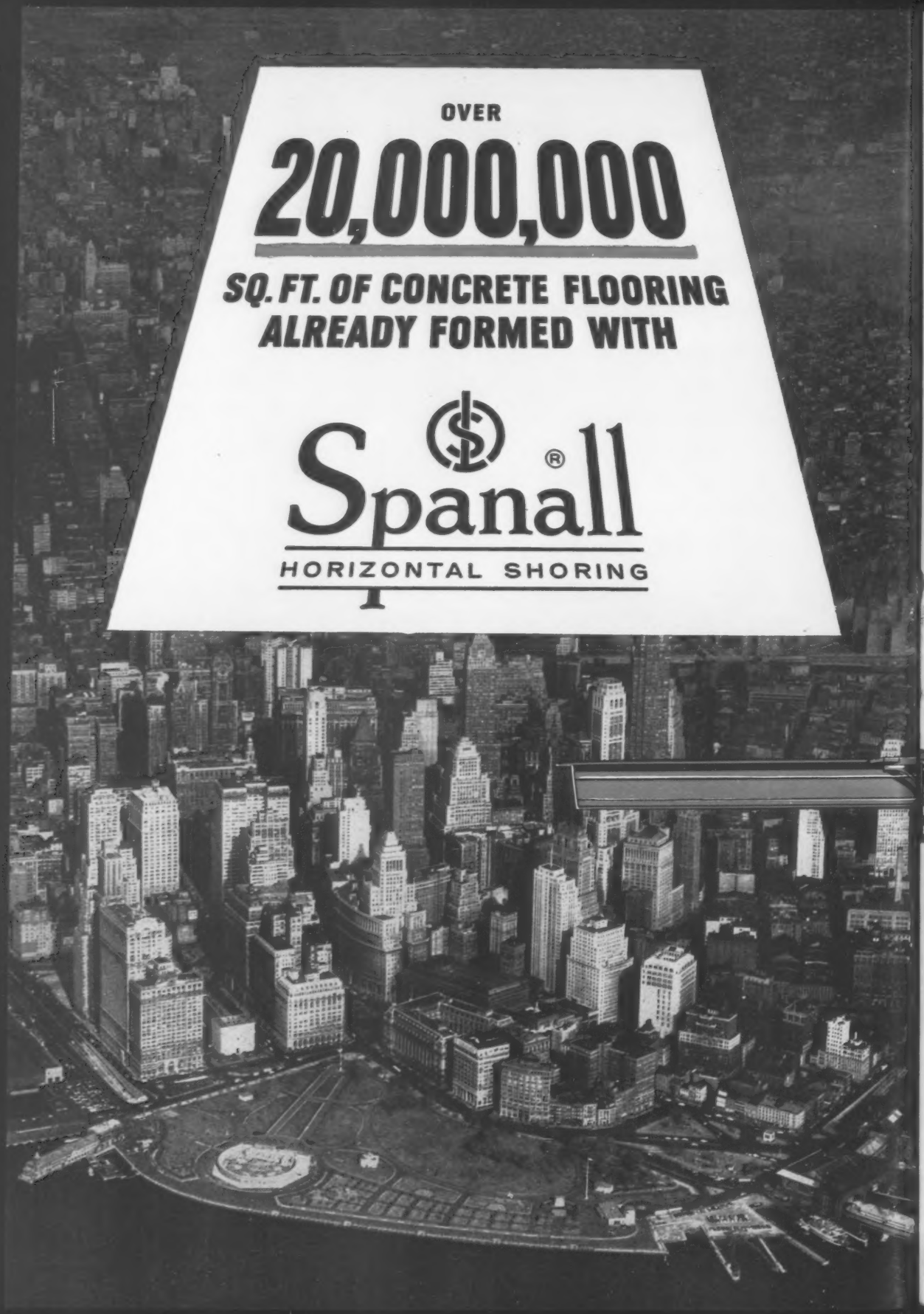
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Spanall®
HORIZONTAL SHORING

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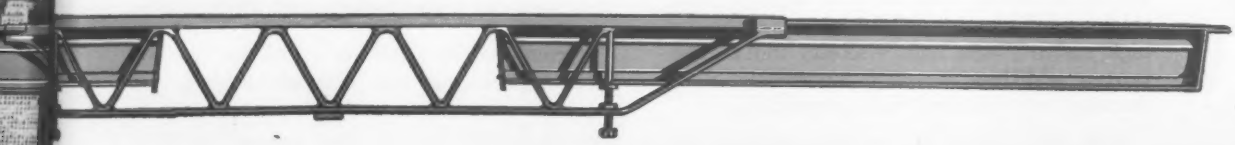
No wonder SPANALL is so popular for beam, slab and suspended formwork! It's so easily installed . . . with built-in camber . . . with ample load-bearing safety factor . . . with clear, open work spaces in areas below the formwork—eliminating forever the forests of cumbersome, costly vertical shoring.

Stripping, too, is fast and easy; SPANALL sections are quickly moved and positioned for successive formwork . . . or telescoped and stored with space-saving economy.

Expert, on-the-job engineering service is always at your command—from your local SPANALL distributor, or from the home office. For complete information write directly to Department E.



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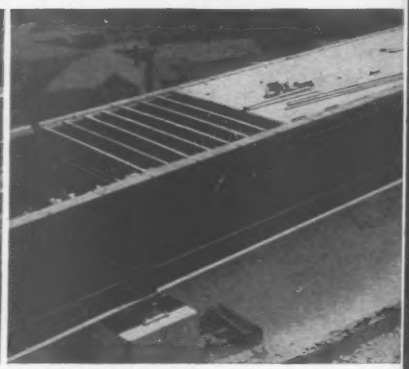
SPANALL HORIZONTAL SHORING efficient time-saver on floor and deck concrete formwork: flat slab . . beam and slab . . structural steel . . metal pan . . drop head . . filler block.



Repeated use of SPANALL HORIZONTAL SHORING, assembled to desired span lengths, speeds formwork construction on Carquinez Bridge along new California State H'way system.

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Perma-Flo Oils
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Vesuvius "X" Gear Compounds

Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

April 23 Vermont

STREETS AND ROADS

April 28 Connecticut April 29 Massachusetts

BUILDINGS—LB & CA

▲ **Reed Homes, Inc.,** 152 Talcott Rd., West Hartford, Conn., Owner Builds, **$2,500,000,** 250 HOUSES Beachwood Copper Mine Road (addnl. 1958 constr. program), **BURLINGTON, CONN.**

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

April 25 Pennsylvania May 1 New York

STREETS AND ROADS

April 25 Pennsylvania April 29 New Jersey

BUILDINGS—SLC

▲ **N. J., Montclair**—HOSPITAL—Mountainside Hospital, Bay and Highland Aves., soon lets contract hospital addns., alterations, $2,500,000. Voorhees, Walker, Smith & Smith, 101 Park Ave., New York 17, N. Y., archts. CD 3/30/56.

BUILDINGS—LB & CA

▲ **Colonial Constr. Co.,** 420 Madison Ave., New York, N. Y., CA approx. **$16,000,000,** St. John's Redevelopment, HOUSING, JERSEY CITY, N. J. Lawrence Hochschwender, 185 Tanglewood Crossing, Lawrence, N. Y. and P. J. Mahoney, 32 Court St., Brooklyn, N. Y. Former owner abandoned project. CD 2/6/56, under CA.

▲ **The Dower Co.,** 3763 Lee Rd., Cleveland 28, O. Owner Builds. **$3,300,000,** 300 HOMES, MARS, PA. Jack Alan Bialosky, Superior Bldg., Cleveland 14, O., archt.

▲ **Hegeman-Harris Co., Inc.,** 30 Rockefeller Plaza, New York 20, N. Y., CA Est. **$3,000,000,** 8 story, limestone marble OFFICE BLDG., 16th and Eye Sts., N. W., WASH., D. C. Hod Carriers' Bldg. and Common Laborers' Union of America, 821 15th St. N. W., Wash., D. C. CD 8/29/56.

SOUTH

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

April 23 Louisiana

STREETS AND ROADS

April 23 Louisiana May 2 Kentucky

▲† **Kentucky and Indiana**—BA 5/8—U. S. Eng., P.O. Box 59, Louisville, Ky., navigation lock, left bank Ohio River near existing Lock No. 41, near Louisville, Ky., CIVENG-15-029-58-50. Over $10,000,000. Extended date. CD 3/21.

BUILDINGS—BA

▲ **Ky., Louisville**—HOSPITAL—BA 5/7—Methodist-Evangelical Hospital Bd., c/o Nevin Morgan, archt., Starks Bldg., Methodist Evangelical Hospital in Louisville Medical Center. $3,500,000. E. R. Ronald & Assoc., 554-S. 3rd St., Zone 2, engrs. CD 8/15/55.

HEAVY CONSTRUCTION—LB & CA

▲ **FLORIDA**—State Road Dpt., Dist. Office, Lake City, **Ballenger Paving Co.,** Greenville, S. C., CA **$2,688,258,** est. $3,000,000, 8.513 mi. from point approx. 8 mi. east of Tampa and point in Plant City, 9 in. c. conc. pavement plant 6½ in. limerock base with Type 1-A bit. surf. base course and binder course constr. 5 concrete box culverts of bridge length; drainage 2 single conc. deck interchange bridges on conc. piling over Antioch McIntosh Rd. branch-Forbes Rd. and Thonotossa Rd. removal of existing bldgs., fencing, FAP Interstate Proj. No. (1-104-1(7) Job. No. (1019-402) SR 400, Hillsborough Co. Bids Feb. 18, awarded Apr. 7. CD 2/24, under LB.

▲† **Al Johnson Constr. Co.,** 608 Foshay Tower, Minneapolis, Minn. LB **$14,666,487** constr. Jackson Lock and Dam with control station, water stage recorder houses, roads and storm drainage, the structure will incl. from right to left bank; a navigation lock, with clear inside dimensions of 110 x 600 ft. and maximum lift of 35 ft., at gated spillway 552 ft. long controlled by 8 individually operated tainter gates a fixed crest spillway 639 ft. long across present river channel and an earth dike about 1,000 ft. long connecting the spillway to high ground on left bank, a 3 story, concrete lock control station will be built on lock wall adjacent to gated spillway, located on Tombigbee River near Coffeeville, ALABAMA. U. S. Eng., 2301 Grant St., Mobile, Ala. Bids Apr. 3. CD 3/10.

▲ **TENNESSEE**—State Hy. Dpt., Nashville, Tenn.—**Oman Constr. Co.,** Acklen Park, Nashville, Tenn. CA **$1,938,888** c. conc. paving and constr. 3 bridges (1 prestressed box beam type for an interchange at 9th St., 1 concrete deck girder for separation at 6th St. and 1 deck girder for an interchange at 4 St.) 0.839 mi. section Interstate Rte. No. 513 in Chattanooga beginning at W. 12th St. and extend to south end of New Tennessee River Bridge. Proj. Nos. I-513 (3) Hamilton Co.; c. conc. paving and constr. curbs and sidewalks 0.059 mi. section State Rte. No. 58 (4th St.) in Chattanooga, beginning at Chestnut St. and extend. to Broad St. Proj. U-060-1 (4) Hamilton Co.;

Tenn.—**Haynes Constr. Co.,** Bluefield, W. Va., CA **$2,522,045** grading, drainage, constr. 3 bridges (1 single and 2 twin structures) 3.457 mi. section Inter. Rte. No. 503 beginning near the Caney Fork River west of Buffalo Valley and extend. to point 2.7 mi. west of Silver Point. Proj. I-503 (14) Putnam Co. Bids Mar. 28. CD 4/2, under LB;

BUILDINGS—LB & CA

▲ **J. A. Jones Constr. Co.,** 209 W. 4th St., Charlotte, N. C., CA Est. **$12,000,000,** constr. NUCLEAR TEST REACTOR, WADESBORO, N. C. Industrial Testing Reactors, Inc., c/o contractor. General Electric Co., Atlic Power Div., 1 River Rd., Schenectady, N. Y., engr. The Ralph M. Parsons Co., 617 S. Olive St., Los Angeles, Calif., consult. engr.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

April 29 Wisconsin

STREETS AND ROADS

April 23 Illinois April 29 Ohio, Wisconsin

BUILDINGS—BA

▲ **Mich., Eloise**—HOSPITAL—BA 6/3—Wayne Co. Capitol Imprvts., James H. Lincoln, chn., 1320 City-County Bldg., Detroit, general hospital, incl. laundry, health center. $12,000,000. Plans deposit $150 general, $50 mechanical and site, $25 electrical. Smith, Hinchman & Grylis Assoc. Inc., 3107 W. Grand Blvd., Detroit Zone 2, archts. CD 10/2.

HEAVY CONSTRUCTION—LB & CA

▲ **OHIO**—Dpt. Hys., State Office Bldg., Columbus, Bids opened 4/1,

O.—**John R. Jurgensen Co.,** 3535 Roundbottom Rd., Cincinnati, O., LB **$2,441,193,** est. $2,517,300 (5 bidders) Type T-35 and structures, 5.232 mi., Delaware, SR 1-7.80, ACI-1105 (36), Proj. No. 50.

O.—**Codell Constr. Co.,** 125 S. Main St., Winchester, Ky., LB **$1,754,783,** est. $1,823,500 (7 bidders) Type T-71 and structures 3.649 mi. Licking-Muskingum, USR 40-28.36, 0.00, ACI-529(15), Proj. No. 51.

O.—**Peter Kiewit Sons Co., & Condon-Cunningham, Inc.,** 15806 Lorain Ave., Cleveland, O., LB **$3,689,196,** est. $3,818,900 (7 bidders) Type T-71 and structures, 5.023 mi. Medina, SR 1-13.63, ACI-1105 (26), Proj. No. 52.

O.—**Manix Brothers,** 1224 Ft. Jefferson Rd., Greenville, O., LB **$228,454,** est. $265,700 (9 bidders) Type T-35 and structures 1.293 mi. Preble, SR 503-(10.27) (15.38), S-144(7), Proj. No. 53.

O.—**Ohio Eng Co.,** 105 Sixth St., Lorain, O., LB **$94,-399,** est. $116,600 (3 bidders) Type T-35 on B-119, 0.508 mi. Lorain, SR-58-27.03 (City of Lorain), Proj. 56, Lorain Co. CD 3/21.

▲ **Kill-Bar Electric Co.,** 2261 N. Clybourn, Chicago, Ill., CA **$2,939,701,** street lighting on arterial streets and state hys. CHICAGO, ILL. City, City Hall, Chicago Ill. Awarded 4/2. CD 11/13/56.

BUILDINGS—LB & CA

▲ **Northcrest Corp.,** c/o N. B. Knapke, Lincoln Bank Tower, Fort Wayne, Ind., Owner Builds. **$2,500,000,** 250,000 sq. ft., 21 unit crescent-shaped SHOPPING CENTER, incl. 2 story unit for Montgomery Ward & Co. at east end of center, parking for 2,000 cars, U. S. 30 and State Road 427, FORT WAYNE, IND. CD 1/30.

▲ **McDonald Eng. Co.,** 208 S. LaSalle St., Chicago, Ill., CA Total est. **$3,000,000,** 12 SILOS at cement plant, SPEED, IND., Louisville Cement Corp., 501 S. 2 St., Louisville, Ky. CD 3/4, under CA.

▲ **Wm. E. Schweitzer Co.,** 2207 Dodge, Evanston, Ill., CA **$4,852,529,** (a) HOSPITAL (b) NURSES RESIDENCE and SCHOOL, SW corner Dempster and Western Ave., EVANSTON, ILL. Lutheran Deaconess Home & Hospital of Chicago, 1138 N. Leavitt St., Chicago, Ill. CD 3/4 under LB.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

April 24 Kansas April 25 Missouri, North Dakota

May 7 Arkansas

STREETS AND ROADS

April 24 Kansas April 25 Missouri, North Dakota

BUILDINGS—BA

▲ **Mo., Fulton**—GENEATRIC INFIRMARY—BA 5/6—Missouri State Hospital No. 1, c/o Ralph McSweeney, dir. P. Bldgs., 100 State Capitol, Jefferson City, three buildings for geneatric infirmary group at Missouri State Hospital No. 1. $2,500,000. Marcel **Boulicault,** Ambassador Bldg., 411 N. 7th St., St. Louis, Zone 1, archt. CD 6/14.

BUILDINGS—LB & CA

▲ **Kraus-Anderson, Inc.,** 501 Eighth St. South, Minneapolis, Minn., CA **$2,500,000,** general contract 2 story, 250x350 ft. RETAIL STORE in shopping center, east of Penn. Ave. South and south of Hy. No. 100, **BLOOMINGTON** (P. O. Minneapolis), **MINN.** R. I. Peterson, Osseo, Minn., and C. E. Turner, 4316 Wooddale Ave., Minneapolis, Minn. Montgomery Ward & Co., lessee. CD 3/13.

FAR WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

April 29, May 7 California

STREETS AND ROADS

April 29 Washington April 30, May 1, 7, 8 California

▲ **Calif., Santa Ana**—BA 5/7—Orange Co. Flood Control Dist., Courthouse, imprv. on Santa Ana River Channel E-1, Part 1, incl. portions of Talbert and Greenville-Bannig Channels. $2,990,000. CD 7/3/56.

▲† **Calif., LeMoore**—MASTER JET AIR STATION, etc. —BA 5/9—12th Naval Dist., Pub. Wks. Office, San Bruno, 1st section Master Jet Air Station, two 13,500 ft. runways, taxiways, aircraft parking, lighting, 4 mi. railroad spur, main station road, water supply, hot water heating plant, transmission lines, water and gas lines, storm drainage and sewage disposal plant at Naval Air Station $20,000,000. CD 4/10.

BUILDINGS—BA

▲ **Calif., Los Angeles**—SCHOOL—BA 4/25—Bd. Educ., 1425 S. San Pedro, constr. Grant High School in SE San Fernando Valley. $3,900,000. Extended date. CD 3/27.

▲ **Ore., Portland**—HOTEL—BA 4/30—Western Hotels, Inc., Olympic Hotel, Seattle, Wash., (selected list of bidders) 200-room addn. to Benson Hotel, $3,000,-000. Victor N. Jones, 1717 SW Park Ave., archt. CD 2/21/57.

▲† **Wash., Spokane**—HOUSING—BA 5/7—Procurement Officer, Geiger Air Force Base, 228 Capehart housing units. Geiger Air Force Base. $4,000,000. CD 3/11/57.

HEAVY CONSTRUCTION—LB & CA

▲† **American Cement Corp. (Riverside Cement Co.),** West Riverside, Calif. CA **$9,741,900.** 3 million bbl. bulk portland cement for Glen Canyon Dam and power plant, Colorado Storage Proj. DS 5023, ARIZONA. Bureau Reclamation, Dpt. Interior, Denver Federal Center, Denver, Colo. Bids Mar. 27. CD 4/3, under LB.

▲ **CALIFORNIA**—State Div. Hys., 120 S. Spring St., Los Angeles,

J. A. Thompson & Son, Inc., Box 518, Inglewood, Calif. CA **$3,135,130,** hy. imprvs. in city of San Bernardino between 0.2 mi. south of Rte. 9 and 0.4 mi. north of 27th St., 6 lane freeway VLLL-SBD-43, 31-SBD, San Bernardino Co. Bids Mar. 13. CD 3/17, under LB.

▲ **CALIFORNIA**—State Div. Hys., 1120 N. St., Sacramento, Bids opened 4/9,

Guy F. Atkinson Co., P.O. Box 1000, South San Francisco, Calif. LB **$6,946,853** (9 bidders) 8 lane freeway 6.6 mi. over Grapevine Grade on U.S. Hy. 99, incl. 3 bridges between Fort Tejon and 2.1 mi. north of Grapevine Station, VI-Ker-A.B. CD 3/5.

BUILDINGS—LB & CA

▲ **Continental Constr. Co. & Lawrence Constr. Co.,** 4671 24th St., Rd., Sacramento, Calif., LB **$4,297,000** Alternate A and LB **$4,117,000** Alternate B (4 bidders) (joint venture) OFFICE bldg. and parking facilities, S St. near 61st St., SACRAMENTO, CALIF. Sacramento Municipal Utility Dist., 2101 K St., Sacramento, Calif. Bids Apr. 8. CD 3/17.

CANADA

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

April 25 British Columbia

STREETS AND ROADS

May 7, 14 Ontario

BUILDINGS—BA

▲ **Ont., Toronto**—OFFICE—BA 5/20 Union Carbide Canada Ltd., 2221 Yonge St., (selected list of bidders) office bldg., 11 story, 65 x 215 ft. main tower and 154 ft. high, 2 bsmnts., gross area, 180,456 sq. ft. no interior columns, floor to ceiling glass, stainless steel, aluminum and black granite facade, Eglinton Ave. E. Total $6,000,000. Shore & Moffat, 51 Eglinton Ave. W., archts. Charles Leopold, 213 Broad St., Phila., Pa., U. S. A., engr. CD 10/9/56.

BUILDINGS—LB & CA

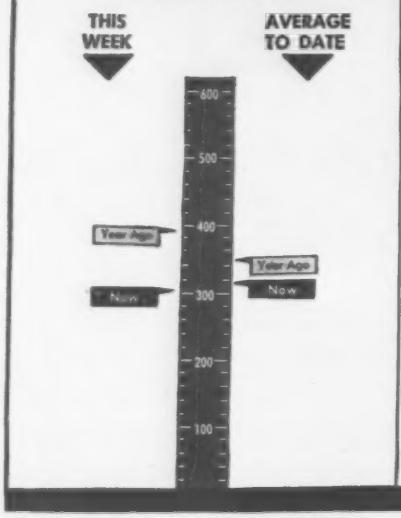
▲ **E. G. M. Cape & Co. (1956) Ltd.,** 4898 Western Ave., Montreal, Que., LB **$7,840,000,** (12 bidders) partly 4 and partly 7 story bsmnt., 200 x 760 ft. rein.-con. frame brick facing SURVEYS and MAPPING BLDG., Booth St., OTTAWA, ONT. Dpt. P. Wks., Hunter Bldg., Ottawa, Ont. Bids Mar. 5. CD 1/31.

(Proposal Advertisement see pp. 185 to 188)

Construction Scoreboard

ACTIVITY THIS WEEK

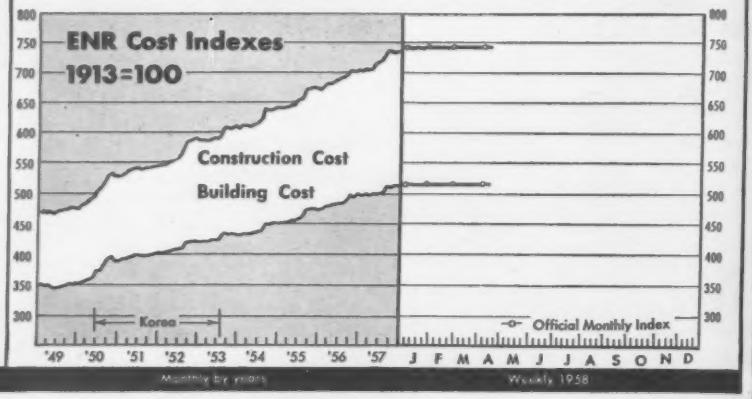
Contract Awards
Millions of Dollars



COST INDEXES AS OF NOW

ENR INDEXES (1913=100), 20-cities' average	Week of Apr. 10 1958	% Change from Mar. 13 1958	% Change from Apr. 11 1957
Construction Cost	746.16	+0.2	+5.0
Building Cost	517.13	+0.2	+3.2

To convert above indexes to 1926 = 100: Divide Construction Cost by 2.080; Building Cost by 1.850.
1949 = 100: Divide Construction Cost by 4.770; Building Cost by 3.518.



AMOUNT OF CONTRACTS LET

By Ownership	This Week	Cum. 16 wks 1958 millions	Chge '57-'58 %
All Heavy Constr.	$304.5	$5,088.9	−9
Private	143.0	2,451.7	−6
Public	161.5	2,637.2	−11
State & Municipal	121.8	2,077.7	−2
Federal	39.7	559.5	−34
By Type of Work			
Public			
Waterworks	9.4	79.5	−20
Sewerage	6.0	165.3	+29
Bridges*	10.4	142.7	−34
Highways	60.5	808.9	−9
Earthwork, Waterways	16.9	204.2	−40
Buildings, Excl. Housing	24.4	693.0	+5
Housing	12.9	316.5	+38
Unclassified	20.9	227.0	−45
Private			
Mass Housing	54.6	1,097.1	+22
Commercial	60.9	577.9	+11
Industrial	24.3	632.8	−38
Unclassified	3.3	144.0	−20

* Includes private bridges.

NOTE: Minimum size projects included are: Waterworks and waterways, $44,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $344,000.

NEW CAPITAL FOR CONSTRUCTION

	Week of Apr. 10	Cum. 15 wks 1958 millions	Chge '57-'58 %
Corporate Securities	$155.0	$1,663.6	−17
State and Municipal:			
All Except Housing	76.0	2,080.2	+29
Housing	...	20.3	−52
Federal Loans	2.7	61.0	+50
Federal Aid	...	....	...
Total Nonfederal	$233.7	$3,825.1	+3
Federal Appropriations:			
Projects in U. S.	...	$520.0	...
Outside U. S.	...	....	...
Total New Capital	$233.7	$4,345.1	+17

CONTRACTS AWARDED

	1958 Mar. (millions)	1958 3-Mos. (millions)	% Change from 1957 Mar.	% Change from 1957 3-Mos.
Total U. S., ENR reported	$1,397.7	$3,831.3	− 5	−16
Private	617.6	1,751.9	+ 1	−18
Public	780.1	2,079.4	− 9	−14
State and Municipal	619.4	1,655.1	+ 9	− 3
Federal	160.7	424.3	−44	−40
ENR Volume Index, 1913 = 100	520	344	− 6	−36

NEW CAPITAL FOR CONSTRUCTION

Total U. S.	$1,131.2	$3,928.4	+ 3	+27
State and Municipal Bond Sales	610.6	1,874.5	+21	+30
Corporate Security Sales	505.5	1,477.8	−12	− 9
Federal Loans, Aid (nonfederal work)	15.2	56.1	−15	+52
Federal Appropriations (federal work)	.....	520.0	....	.....

MATERIALS SHIPMENTS

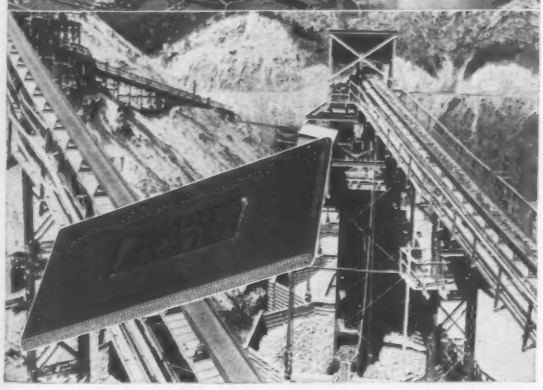
Unit	1957 & 1958 Dec. (D) Feb. (F) Mar. (M)	1957 & 1958 Jan. (J) Cum. (No. of Mos.)	Percent Change from Year Ago Mo.	Percent Change from Year Ago Cum.
Portland Cement, Bur Mines, thous bbls	13,618(J)	13,618(1)	+15	+15
Concrete Paving Awards, PCA, thous sq yd	7,553(M)	17,595(3)	−21	−27
Fabricated Structural Steel, thous tons	283(F)	600(2)	−11	− 2
Bookings, AISC, thous tons	186(F)	348(2)	−37	−43
Reinforcing Bars, Net, AISI, thous tons	107(F)	225(2)	−55	−51
Lumber, NLMA, mil fbm	2,302(F)	4,766(2)	− 7	− 5
Orders, mil fbm	2,272(F)	4,855(2)	−11	− 5
Production, mil fbm	2,327(F)	4,803(2)	−11	− 8
Douglas Fir Plywood, DFPA, ⅜", basis				
Production (average per week), mil sq ft	111.5(F)	110.4(2)	+16	+13
Orders (average per week), mil sq ft	125.8(F)	111.7(2)	+13	+16
Clay Products, Bureau of Census				
Brick, Unglazed, Common, Face, mil bri	385.0(D)	6,094.6(12)	− 3	− 9
Vitrified Clay Sewer Pipe, thous tons	87.9(D)	1,638.6(12)	−20	−12
Structural Tile, Unglazed, thous tons	37.2(D)	578.0(12)	−19	−14
Asphalt Products, Bureau of Census				
Asphalt Roofing, thous sales sqs	2,974.8(J)	2,974.8(1)	−24	−24
Asphalt Siding, thous sales sqs	62.0(J)	62.0(1)	−40	−40
Aluminum, Wrought, Net, Bur Census				
Sheet and Plate (non-heat treatable), mil lbs	67.8(J)	67.8(1)	−15	−15
Wire and Cable, mil lbs	21.9(J)	21.9(1)	−18	−18
Extruded Shapes (soft alloys), mil lbs	48.2(J)	48.2(1)	−1	−1

EMPLOYMENT AND FAILURES

Contract Const Employment, BLS, thous	2,391(F)	2,501(2)**	−11	− 6
Contractor Failures, Dun & Bradstreet				
Number	177(F)	353(2)	− 2	− 1
Liabilities, thous	$8,747(F)	$18,615(2)	+ 4	− 3

**Average per month

★ Big Jobs Coming Up?



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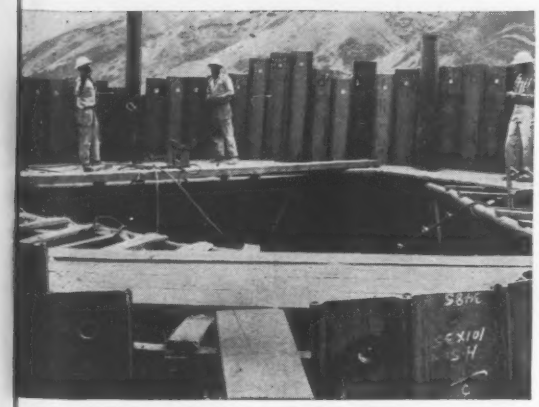
4,685 tons of USS Steel Sheet Piling are being used to construct this huge cofferdam, by the prime contractor Merritt-Chapman & Scott Corp. of New York, to divert the Columbia River in the building of Priest Rapids Dam.

USS Steel Sheet Piling helps change Indian territory into an industrial district



Close-up of one cell of the cofferdam showing tight interlocking piling driven around a template.

The huge Priest Rapids Dam, near Ephrata, Washington, is designed to supply power for the growing industry of the Northwest.

Curious Indians from the nearby Wanapum Reservation, who often have difficulty setting even a fence post in the hard, rocky soil, watch with awe as a huge, steam-powered pile driver hammers foot after foot of USS Steel Piling into the hard earth.

Some 4,665 tons of USS Steel Sheet Piling are being used in a temporary cofferdam which will divert the waters of the Columbia River and permit work to proceed on the $92,000,000 Priest Rapids Dam. This project is being built by the Public Utility District of Grant County, Washington.

The dam will be 9,545 feet long and have a maximum height of 178 feet. It will have a concrete center section 2,427 feet long with about 7,000 feet of earthen embankment. When completed it will contain ten generating units, each with a capacity of 83,000 kva.

USS MP-101 straight-web piling was used in the cofferdam to obtain maximum strength in tension. Piles in lengths from 35 to 50 feet were driven from 5 to 20 feet to solid footing.

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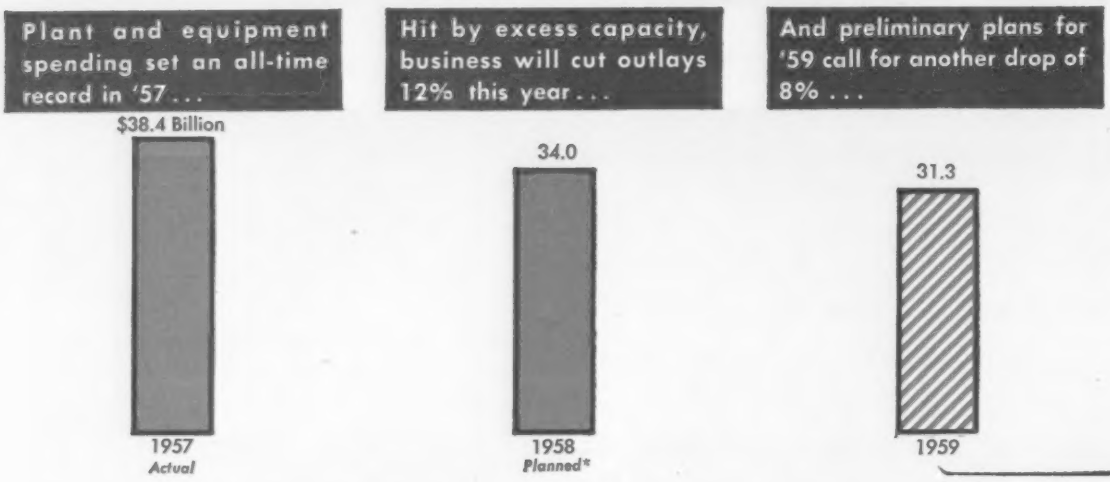

Plant and equipment spending set an all-time record in '57 . . .
$38.4 Billion
1957
Actual
Hit by excess capacity, business will cut outlays 12% this year . . .
34.0
1958
Planned*
And preliminary plans for '59 call for another drop of 8% . . .
31.3
1959

THE LONGER LOOK:

Capital Outlay Decline May Bottom Out

Business spending on new plants and equipment, which set a new record of $38.4 billion in 1957, will be down 12% this year and—according to present plans—off another 8% in 1959. But these plans indicate an end sometime in 1959 to the steep slide in capital spending that began last fall.

Already, preliminary plans call for an upturn in capital spending in 1960 in manufacturing, railroads, and other transportation and communications industries. Under favorable conditions, even total capital spending in the coming four years might rise substantially over present plans. But a prolonged slump could mean more cuts.

These are some of the key results of the 11th annual survey of business' plans for new plants and equipment, just completed by the McGraw-Hill Department of Economics. This survey is not a forecast, but a report of actual plans of companies accounting for some 40% of all manufacturing employment and a broad sample of leading companies in other industries.

In their own planning, most companies are banking on a short life for the current business recession. Manufacturing companies, on the average, expect their sales to increase 20% between 1958 and 1961. In fact, they look for a pickup in sales before the end of 1958, which would hold sales within 2% of 1957 levels.

While they are optimistic on future sales prospects, most companies are cautious on additional expansion, some increases in capacity are planned for this year and the coming three years. But increased emphasis in spending plans is going to replacement, modernization and alterations.

In the outlook for the longer run, the fact that business is investing more money in reasearch and development this year than ever before is significant. For out of this expanding research program will come the new products and new processes that will require new plants in future years. Industry is increasing research outlays 19% by 1961.

This year's decline in capital expenditures affects all major industrial sectors except electric and gas utilities, where spending will rise 3% over 1957. However, many utilities will be completing expansion programs this year, and present plans call for a 10% drop in this sector next year.

The bulk of this year's decline in business outlays is in manufacturing industries, which will spend $2.5 billion less than in 1957. The biggest percentage drop is in the railroad industry, where spending is being slashed by 43%. However, smaller drops of 7% and 8% are scheduled for the petroleum industry and commercial companies.

Among manufacturing industries, the largest cuts were reported by nonferrous metals (−36%), paper and pulp (−35%), autos, trucks and parts (−33%) and iron and steel (−29%). The only manufacturing industry planning to spend more on plant and equipment this year is electrical machinery.

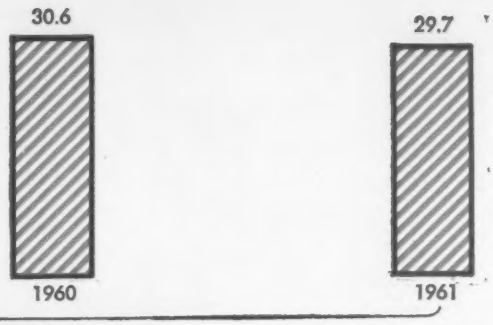
In the machinery industry, which expects to spend 18% less than in 1957, the construction and mining machinery manufacturers reported plans to cut capital outlays by 38%. This probably reflects disappointing orders in the past year.

Virtually all industries now expect to spend less in 1959 than this year. The only exception in manufacturing is the rubber industry. Among nonmanufacturing industries, petroleum plans to spend more (mostly for crude production) and railroads expect to hold steady at the 1958 level.

In 1960, however, most manufacturing industries have plans for some increase in outlays. Except for electrical machinery and rubber, these plans still call for figures lower than those of 1957 or 1958. But in past McGraw-Hill surveys, estimates for two, three and four years ahead have usually been raised as the actual time of spending years.

Lagging sales and a widening gap between operating rates and capacity are the main reasons behind the current cutbacks in capital outlays. In

Advance plans for '60 and '61 – already large – may be increased as time of actual spending nears



*Preliminary Plans**

**McGraw-Hill Dept. of Economics*

ut During 1959

an earlier McGraw-Hill survey, manufacturing companies stated that, on the average, they prefer to operate at about 90% of capacity. But the average operating rate reported to McGraw-Hill has been declining steadily since the end of 1955.

	Operating Rate
Dec. 1954	84%
Dec. 1955	92%
Dec. 1956	86%
Sept. 1957	82%
Dec. 1957	78%

Further declines in production schedules, and additions to capacity, since the turn of the year have brought the average operating rate down a few points more. Even at the end of 1957 every manufacturing industry was operating below its preferred rate.

Manufacturing capacity has been growing at a rapid clip for several years. Total producing capacity is now 50% greater than in 1950, and about 20% greater than in 1954. Some industries have added more than 75% to their 1950 capacity—transportation equipment, electrical machinery, machinery, chemicals and nonferrous metals.

• **Trend to alteration**—The swelling volume of spare capacity has persuaded many manufacturing industries to slow down on further expansion and switch the emphasis of their spending program to replacement, modernization and alteration. In most past years, manufacturers have split their outlays about equally between modernization and expansion.

This year, however, only 44% of capital expenditures in manufacturing will go for expansion, the other 56% being for replacement and modernization. And in longer-range plans for 1959-61, the average split gives only 38 cents of the capital spending dollar to expansion programs.

Nevertheless, all manufacturing industries are planning some additions to capacity in the coming four years, and a few will add sizable chunks. Nonferrous metals will add 20% this year and another 20% by 1961; chemicals, 7% this year and another 19% by 1961; and electrical machinery, 7% in 1958 and 18% in 1959-61.

Expansion plans in these industries are based on expectations of a quick end to the business recession and a strong rise in sales over the next few years. Manufacturers as a whole expect their sales to climb 20% between 1958 and 1961.

In some industries the anticipated increase is much larger. Electrical machinery producers look for a 34% rise. The steel and auto industries, which are resigned to sales slumps of 15% and 10% respectively, this year, are forecasting gains of 33% and 32% by 1961.

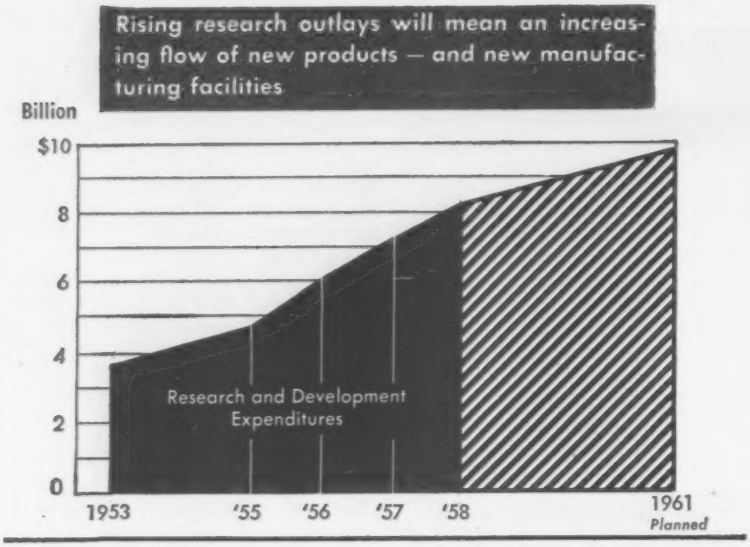
Because of the economic climate at the time this year's survey was taken (February and March), McGraw-Hill asked for additional information on possible revisions of spending plans under changing business conditions. The "maximum" and "minimum" figures indicate the broad range within which

Capital Spending Plans by Industry

	1957 Actual	1958 Planned	Percent change	Preliminary plans 1959	1960	1961
	Millions of dollars					
Manufacturing	$13,647	$11,129	−18%	$9,138	$9,178	$9,130
Iron & steel	1,844	1,309	−29	733	748	726
Nonferrous metals	980	627	−36	339	305	302
Machinery	1,275	1,043	−18	887	916	954
Electrical machinery	599	623	+ 4	604	652	691
Autos, trucks & parts	1,058	709	−33	638	651	612
Transportation equipment	544	528	− 3	333	300	303
Other metalworking	942	690	−27	631	656	688
Chemicals	1,724	1,569	− 9	1,349	1,349	1,282
Petroleum Refining*	853	768	−10	737	752	647
Paper & pulp	811	527	−35	443	474	450
Rubber	200	172	−14	191	210	210
Stone, clay & glass	572	493	−14	426	455	471
Food & beverages	850	819	− 4	795	654	662
Textiles	408	347	−15	296	313	324
Miscellaneous	987	905	− 8	736	743	808
Nonmanufacturing	24,790	22,882	− 3	22,184	21,430	20,554
Petroleum industry*	5,797	5,371	− 7	5,604	5,407	5,331
Mining	450	392	−13	244	224	216
Railroads	1,396	796	−43	796	868	911
Other transportation & communications	4,604	4,114	−11	4,053	4,372	3,913
Electric & gas utilities	6,197	6,354	+ 3	5,733	5,339	4,918
Commercial	7,199	6,623	− 8	6,491	5,972	5,912
ALL BUSINESS	38,437	34,011	−12	31,322	30,608	29,684

** Petroleum refining, included under both manufacturing and petroleum industry, counted only in manufacturing total*

DATA: McGraw-Hill Department of Economics, U. S. Department of Commerce and Securities & Exchange Commission



plans may change in the event of either a roaring boom or a prolonged slump.

• **Maximum, minimum range**—Under highly favorable business conditions, business as a whole might spend on new plants and equipment an average of $39.4 billion over the years 1958-61. However, a substantial worsening of the present state of business might pull capital spending down to an average of only $22.4 billion in the four years.

Present plans call for $34.1 billion in plant and equipment outlays this year, an an average of $30.5 billion in the years 1959-61. So business plans now fall almost midway between the upper and lower limits.

In percentage terms, the biggest prospective gain in capital spending in the event of a business boom would be in mining, which might invest 56% more than the present planned figure. Manufacturing might spend 35% more, with similar prospective gains in utilities and commercial.

On the downside, if business should get worse, railroads might cut spending plans by 45%, other transportation and communications by 43% and manufacturing by 37%. Utilities say they would trim plans only 17% below present average figures, and commercial business firms a mere 5%.

• **Research outlays up**—One of the most promising signs for future capital spending in the new McGraw-Hill survey is the continued expansion of industrial research and development programs. These programs are turning out the new products and new processes that provide the basis for growing sales and plant expansion in the years ahead.

Business now plans to invest 14% more in research and development this year—a total of $8.3 billion—than in 1957. And it expects by 1961 to increase R&D budgets almost 20% more, to a total of nearly $10 billion. Business, furthermore, is doing this during a time when it is reducing plant and equipment expenditures—and also in face of a decline this year in sales and profits.

If business carries out its current plans for boosting research spending, it will be putting more than twice as much into this creative effort in 1961 as it did in 1955.

The chief purpose of research in manufacturing is the development of new products—listed by 48% of participating companies as their principal research objective. Another 41% reported improvement of present products as their main purpose. And the remaining 11% are working mostly on new processes.

• **New facilities needed**—Industry is banking heavily on new products from research in its sales plans for 1961. In manufacturing as a whole, companies expect that 12% of their 1961 sales will be in products not produced in 1957. And many of these new products will require new producing facilities.

Manufacturers rate the payoff on their present research efforts very high. Only 9% expect their research expenditures to take more than five years to pay off, while 39% expect a payoff in less than three years. Most companies (52%) look for research outlays to pay off in three to five years.

The new McGraw-Hill survey confirms the recent survey by the U. S. Department of Commerce and the Securities and Exchange Commission, which reported a drop of 13% in capital spending this year. It indicates also some lowering of sights since the preliminary survey conducted by McGraw-Hill last fall, when the expected drop for 1958 was only 7%.

The advance plans for 1959-61, however, indicate a stabilizing of capital spending at a high level by the standard of most earlier years. And these plans may well increase as they are reviewed in light of business conditions later.

"Saving" Money

Bridge toll cut to extend debt; future economy cited as reason for action

It is a rare occasion when a public agency decides to remain in debt for a longer time than necessary. But that was the reason cited by the Delaware Interstate Highway Division when it ordered a one-third cut in toll charges on the Delaware Memorial Bridge.

Legislation authorizing the bridge called for an end to tolls in 1978 when its bonds were paid off. At the present rate, the structure would be debt-free in three to four years, according to division officials. When that occurs, the state will have to assume the financial burden of bridge maintenance, estimated at approximately $1 million yearly.

Garrett E. Lyons, chairman of the agency, said the one-third reduction in toll charges will stretch out the period of indebtedness and, at the same time, the new tolls will be "enough to assure us sufficient income for operation and maintenance while simultaneously meeting the obligations of the bond issue indenture. This is our first real step toward holding off the day when this bridge may become a burden on the people of Delaware—a day that I hope will never arrive."

Old rates and new rates are:

• Passenger cars—now 75 cents; new rate, 50 cents.

• Three axle trucks—now $1.50; new rate, $1.

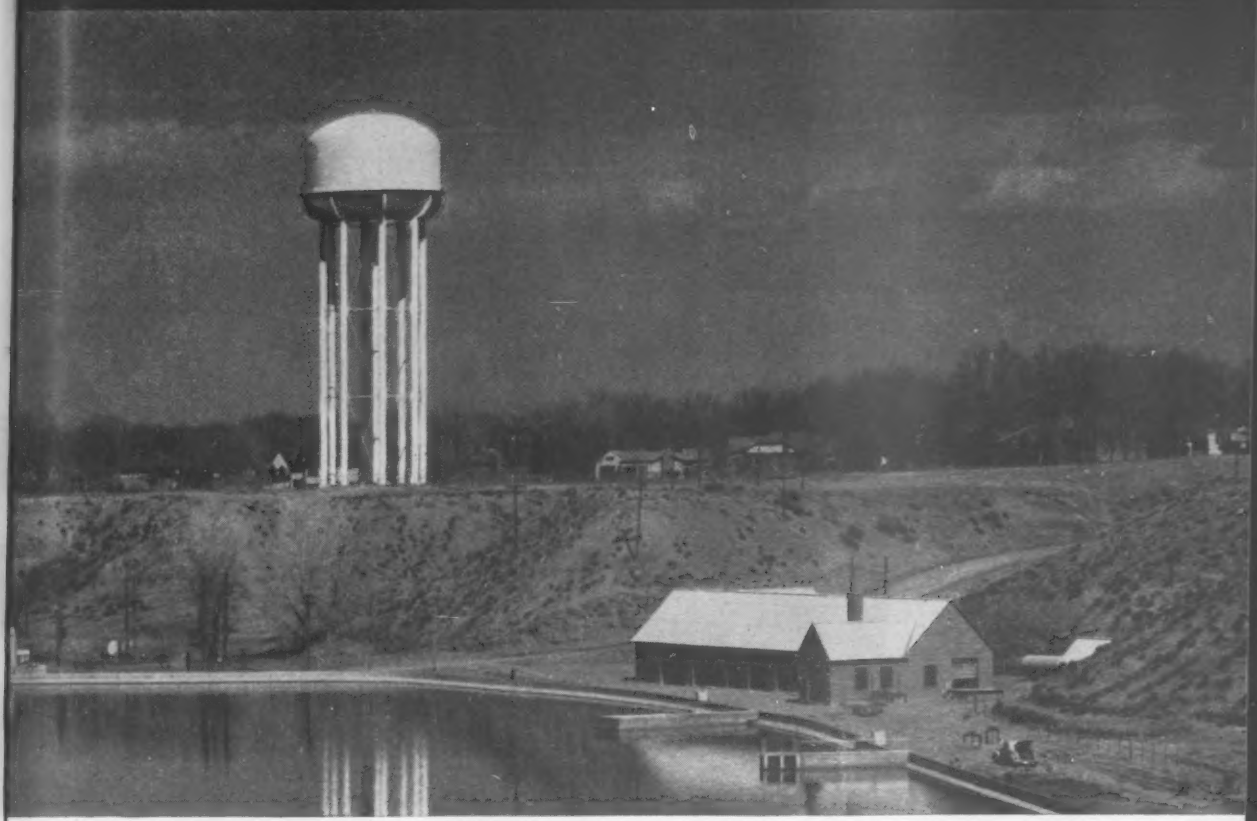
• Four axle trucks—now $2; new rate, $1.50.

• Five axle trucks or truck combinations—now $2.50; new rate, $1.75.

• Commutation rates also will be lowered.

(*B&F continued on page 180*)

MODERN WATER STORAGE at Pueblo, Colorado



750,000 gallon tank on 120 ft tower. Diameter 62 ft. Head range 35 ft.

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Contractor Failure Halts Major Halifax Projects

The bankruptcy of Brookfield Construction Co., Halifax, has closed down three major jobs in the area having an estimated contract value of $11 million.

Among the projects halted by the action are the 10 story federal government building at Halifax, a new treatment center for Nova Scotia Mental Hospital and an army housing project at Camp Gagetown, New Brunswick. The federal building was within two weeks of completion at the time of the bankruptcy action during the latter part of March.

Failure of the contracting firm reportedly resulted from exhaustion of financial resources through loss of money on contracts held.

U. S. Glass Firms Merge, Become French Subsidiary

Antitrust officials of the U. S. Department of Justice have approved the merger of two U. S. glass companies and their acquisition by a large French glassmaker. Under the plan, American Window Glass Co., Pittsburgh, and Blue Ridge Glass Corp., Kingsport, Tenn., will form the American subsidiary of the Societe Anonyme des Manufactures des Glaces et Produits Chimiques de St. Gobain. The merged firms will be known as American St. Gobain.

An earlier attempt at merger by the U. S. firms was blocked by government antitrust action.

Business Briefs . . .

• **Another record**—Dravo Corp., Pittsburgh, reported a new high for net income and billings on which profits were taken during 1957. Income after taxes was $5.2 million last year as compared with $3.2 million in 1956. Billings on which profits were taken in 1957 totaled $107.2 million, an 8% increase over the $98.9 million registered in 1956.

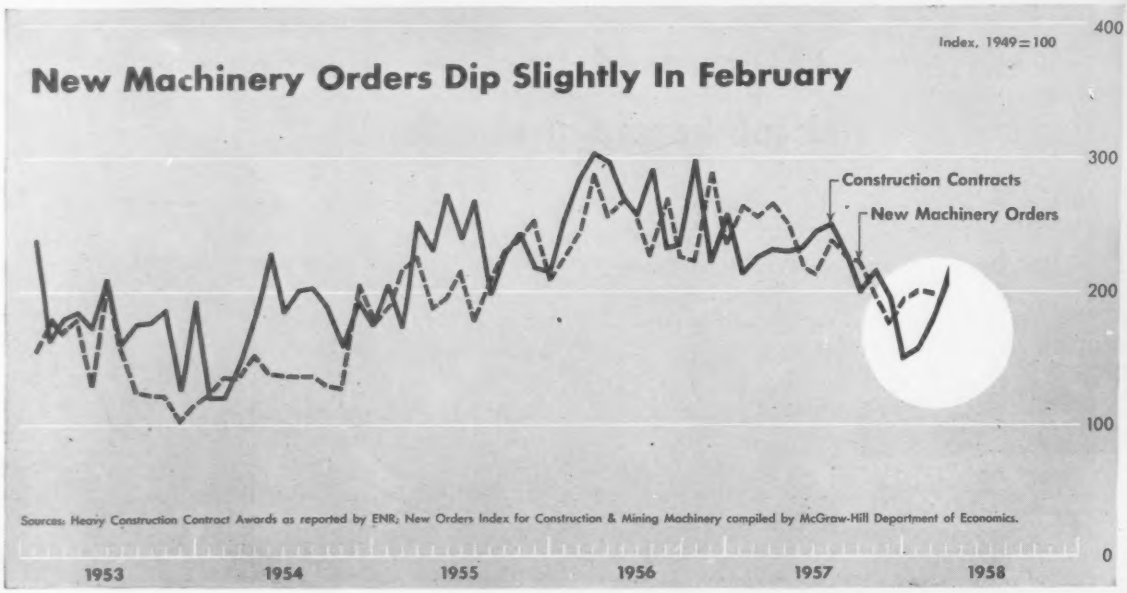
• **Equipment firm merger**—Hyster Co., Portland, re., has acquired Martin Machine Co. of Kewanee, Ill. Hyster manufacturers auxiliary tractor equipment, lift trucks and other materials handling machines.

• **Cement plant expansion**—Kosmos Portland Cement Co. of Louisville, subsidiary of Flintkote Co., plans to increase production by 45% to a total of 3.2 million bbl. The expansion will be completed by mid-1959.

• **Earnings increased**—Arthur G. McKee & Co., Cleveland engineering and construction company, reported that 1957 earnings soared 63% above 1956 to a total of $3.4 million or $6.56 a share as compared to $2.1 million or $4.04 a share in 1956.

• **Machinery sales volume promising**—Warner & Swasey Co., Cleveland, reports that its Construction Machinery Division should increase its dollar volume in 1958. In 1957, its Gradall line accounted for 30% of total sales volume of $56.4 million.

• **New acquisition**—Gregory Industries, Inc., Toledo, has acquired J. D. Polis Manufacturing Co., Chicago, maker of self-drilling expansion anchors and other types of fasteners used in concrete building construction and maintenance.

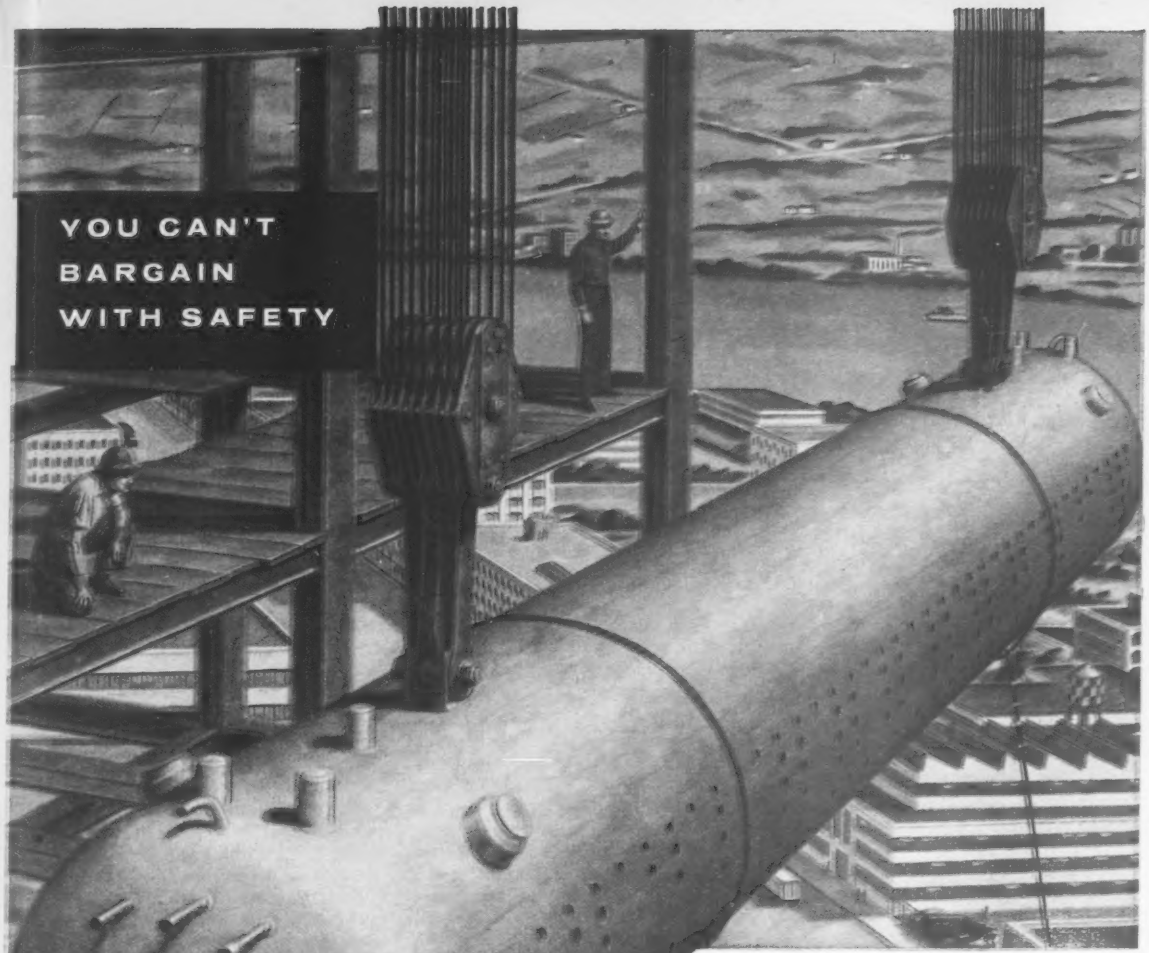


Strength in Awards to Speed New Orders Pace

The rebound in heavy construction contract awards is not yet fully reflected in new orders for construction machinery. Though February business held close to the volume attained in January, according to the McGraw-Hill Department of Economics index, a further increase is due. This should show up in the March orders, and more certainly April orders will show recovery because the upturn in heavy construction contract awards is now in its fourth month.

The business pickup was reported last week by Caterpillar Tractor Co. which said that March business showed an improvement over February. However, it was not up sharply enough to warrant a limited boost in the company's employment roster as had been anticipated early in March by the firm.

The February orders index is at 200, based on 1949 = 100, only a shade below January's reading of 202. Those first two months averaged out at 24% less than the orders index average in the same months of 1957.



This 240,000-pound steam drum, built by Combustion Engineering for a large generating plant, is here being hoisted 120 feet into position by strong wire rope. It's a striking example of how . . .

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More Bark Than Bite in Wage Talks

Contractor resistance to wage demands is stiffening with apparently little effect on construction costs

The construction industry appears to be running into a paradoxical situation as it moves deeper into its collective bargaining season.

For the first time in many years, a serious economic recession, widespread unemployment, wage freeze proposals from both labor and management, a new interest in productivity, union and contractor efforts to curtail featherbedding and a growing awareness of what the law prohibits in labor contracts has conspired to produce greater contractor resistance to wage demands and more queasiness and apparent tractability on the part of unions. But paradoxically wage demands have remained high, strikes have not become the rule and final settlements have tended to follow established in less complicated and more prosperous years.

In dollars and cents, current wage increases of 10, 12½, 15 and 20 cents or more an hour are as common this year as they were last year. Fringe benefits continue to be improved. Contracts for longer than one year periods are still being negotiated although some unions, hedging against an uncertain future, are showing a preference for one-year contracts. In general, the momentum of the past rolls on, generated in part by the nature of the industry and by deferred wage increases that average about 15 cents in existing long-term contracts.

• **The climate**—In California, for example, where the volume of current bargaining is fairly low because of the number of unexpiring long-term contracts, employers feel the downturn in employment, which incidentally is making the unions increasingly security-clause conscious, will weaken labor's bargaining position.

But a recently concluded agreement between the tile layers Local 19 and tile contractors of northern California makes this look like a doubtful conclusion. Union won a 60 cent package in a two-year contract (22½ cents now, 25 cents next year, 2½ cents more for health and welfare, 10 cents for pensions starting next year). The increase exceeds the 47 to 52½ cent pattern of increases set last year in contracts negotiated with the basic crafts by the Northern and Central California Chapters of Associated General Contractors.

In New Jersey, where construction volume has slipped and where some unions report 40% to 50% of their members idle, the Building Contractors Association of New Jersey is making a determined effort to hold the line on wages. Some members are pushing for a 25 cent rollback in rates.

With the bulk of labor contracts expiring in the next six weeks, the association is facing wage demands ranging from 25 cents to $1.08 an hour. One of the few settlements to date gives bricklayers in Perth Amboy and New Brunswick a 10 cent increase in a one-year contract.

Preliminary negotiations, however, have postponed the showdown on wages and concentrated on contractor efforts to eliminate questionable hiring clauses (which are said to be widespread) and to get the building trades' "Ten Commandments" against wasteful work practices incorporated in the new agreement. Here, emphasis is on those relating to welding tools, foremen, stewards, jurisdictional disputes and starting time.

Contractors are taking a similar approach in Cleveland, Ohio, where unions are asking for increases of 25 cents with emphasis on basic rates rather than fringe benefits.

No settlements have been made but contractor resistance is as high as it's ever been and general feeling is that any wage increases must be compensated for by increased productivity by the trades. One contractor spokesman told ENR that building prices "are just about at the limit as far as the public is concerned."

The Building Trades Employers Association is trying to win labor's approval of a nine-point code of productivity to assure a "full day's work for a full day's pay." "There can be no consideration of a wage increase with the building trades council," said the association's vice president, "until satisfactory agreement on these points has been reached with the unions."

What is all this adding up to? It's perhaps too early to tell but here are some reports that apear to be straws in the wind:

• **Oregon**—Slowness of work and keen competition have produced a definite "stiffening of attitude" on the part of Portland contractors. Two-year contracts are the goal and contractors seem to be willing to pay more for stability than a one-year contract would require. Unions are cooperating on a clean-up of hiring clauses to meet a National Labor Relations Board mandate but have attempted unsuccessfully to substitute nondiscriminatory hiring halls.

Settlements with the AGC Building Division include these: Laborers—a 20 cent increase plus 10 cents in health and welfare; lathers—a two-year contract for 20 cents in three installments (10, 5 and 5 cents); brick masons—no increase over present $3.65 but an automatic opening if the cost of living rises 5% over Jan. 1, 1957.

• **Connecticut** – Three strikes – sheet metal workers, laborers and carpenters —have plagued the industry.

The four-day strike of sheet metal workers (Local 60) ended in a 27 month contract calling for a 27 cent wage boost —12 cents retroactive to April 1, 10 cents July 1, 5 cents Jan. 1. Pension fund contributions will be upped to 10 cents and a vacation fund (7 cents for which the union traded two paid holidays after Jan. 1, 1959) will be established.

Meanwhile, Hartford and New Britain laborers struck (with picket lines) the AGC for a three-year contract with a 92 cent wage increase (in three installments of 42, 28 and 22 cents each) plus eight paid holidays (they now have none). Some independent contractors settled for a 57 cent, three-year contract.

Third strike (carpenters) is against the New Haven general contractors. Union is demanding a 15 cent pay boost plus 15 cents for pensions.

• **Missouri, New York**—Reports from St. Louis and Albany are inconclusive because most of the major contracts (as in the case of New York City) are long-term agreements that will not expire this season.

St. Louis plumbers, however, have just signed a contract retroactive to July 1 calling for a 15 cent increase by July 1. In other negotiations, fewer strikes are expected than last year, contractor resistance has shown little change, negotiations are amiable, basic rates are expected to go up but fringe benefits will probably show little change. Trend is toward longer contract periods. Hir-

ing clauses are no problem but interest in the standard union shop 30-day clause is increasing.

In Albany, where iron workers, carpenters, laborers and teamsters are now negotiating, contractor resistance is reported greater than before but no strikes are imminent. Contractors are seeking longer-term contracts; unions want short ones. Hiring clauses are being revised amiably. Expulsion of the teamsters from the AFL-CIO has—here as elsewhere—created no problems.

• **Massachusetts**—So far there have been no major settlements in the state but negotiations are under way in the Boston area with building trades and common laborers (on strike since April 1), carpenters and bricklayers.

In the laborers strike, which has halted all major construction work in the Greater Boston area, the union is seeking a three-year contract with a 55 cent basic rate increase spread over the contract term, plus three cents more for welfare. The AGC and Boston Building Trades Employers Association have offered five cents a year.

Contractors are resisting the union demand along a solid front and feel this is no time to increase construction costs by raising wages.

• **Texas, Washington**—In Dallas and Seattle this is an off season because of long-term contracts or mid-summer expiration dates. Negotiations are under way in Houston but no difficulties are expected.

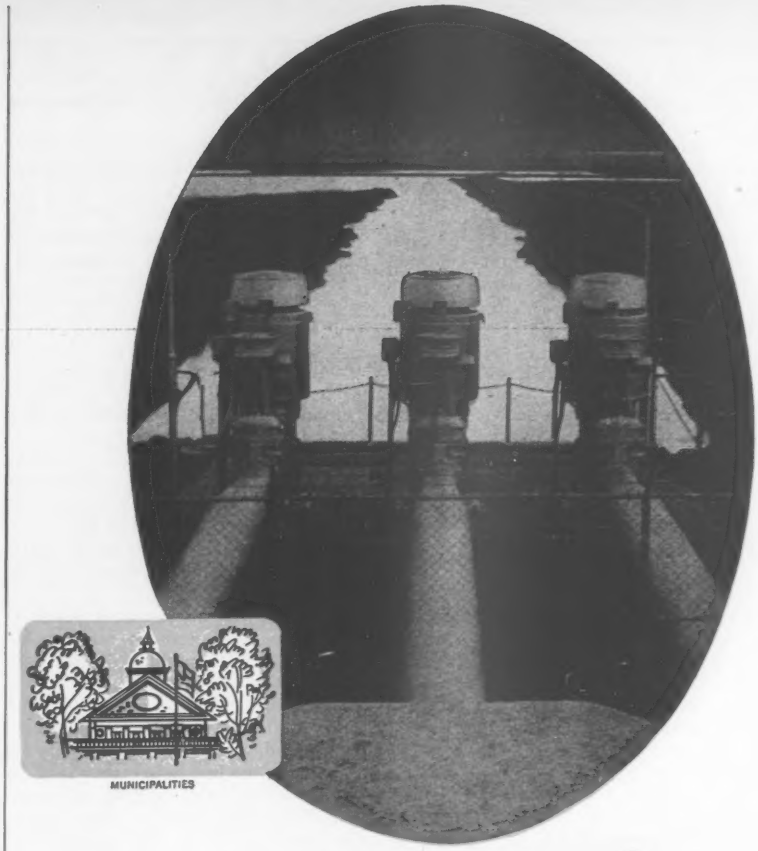
Dallas' one completed contract gives the iron workers a 12½ cent wage increase in a one-year contract.

Only contract under negotiation in Seattle is with the cement finishers. Agreement has been reached on a 19 cent increase, which conforms to a pattern previously set by carpenters and laborers. Contractors have rejected two union demands and on these will risk a strike if necessary: Contract termination in the summertime instead of the end of the year; doubletime on overtime on heavy and highway construction projects beyond the city limits instead of time and a half.

• **Illinois**—In Chicago, where a 20 cent pattern has been common, contractors seem to be showing firmer resistance to current demands.

Carpenters are seeking 30 cents an hour, cement masons 25 cents, structural iron workers 30 cents.

The Builders Association of Chicago feels "no increase is justified at this time." Its executive secretary estimates



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that a 20 cent wage increase to the building trades would push construction costs up 4% to 5%. "This," he said, "will encourage the abandonment of big construction projects. It looks to employers like labor will be pricing itself out of business. Volume of construction is down, men are out of work and competition for a construction job is keener than before."

Chicago homebuilders, whose association has been denied the right to bargain directly with the carpenters, will have to accept whatever the BAC agrees to. The metropolitan homebuilders association views the carpenter demand as fantastic in view of the present economic situation and estimates it would raise the cost of building a house by $500 to $1,000.

• **Elsewhere**—In other areas, Local 709 of the United Mine Workers' District Fifty has signed a two-year contract with Acme Construction Co., Skelton, W. Va., for a 10 cents raise each year. Denver, Colo., plumbing, heating, refrigeration and air conditioning workers have won a 25 cent wage boost (15 cents as of April 1, 10 cents Oct. 1) in a one-year contract with the Denver Association of Plumbing Contractors, and the Heating, Piping and Air Conditioning Contractors Association.

In Providence, R. I., Local 1695 of the carpenters union (cabinet makers and allied workers) have rejected a 10 cent offer and struck for a one-year contract that will grant a 40 cent increase, plus two weeks paid vacation instead of one, and nine paid holidays instead of seven.

Carpenters in Broward County, Fla., have rejected a 15 cent offer and are holding out for 35. To push their demands, they are refusing to work for their own contractors and are getting jobs with Dade County (Greater Miami) contractors who are working in Broward and paying the $3.20 rate they want.

In Wayne, Oakland and Macomb Counties of Michigan negotiations are underway for 60,000 building tradesmen in unions affiliated with the Detroit Building Trades Council.

Because of the economic situation, unions have been slow in announcing their wage demands. But carpenters have come out for 35 cents in a two-year contract, boilermakers for 30 cents. Union says the carpenter figure is below the national pattern.

Biggest of the management negotiating groups—AGC and the builders Association of Metropolitan Detroit—are highly cost-conscious. AGC says it is adamant in freezing rates at present levels. Serious talk begins this week. Present indications are that settlements will not be reached before the April 30 termination of most existing contracts. One straw in the wind is this: A teamster local embracing 900 employees in the Detroit area transit-mix companies has settled on a three-year contract calling for a 43 cents wage increase in installments of 14, 10 and 19 cents.

Number Out of Work Increases

The number of persons employed in the construction industry rose by 140,000 last month, although the total number of the nation's unemployed continued to climb slowly.

According to figures released last week by the U. S. Departments of Labor and Commerce, 5,198,000 persons were unemployed at the end of March. This represents an increase of 25,000 since February and an increase of 2.3 million over a year ago. At the same time, total employment rose to 62.3 million, marking a gain of 300,000 since February. Most of the increase stemmed from the fact that seasonal increases in outdoor work, such as agriculture and construction, and additions to the work force, more than offset further cutbacks in manufacturing employment.

State insured unemployment, in the meantime, advanced by 135,000 to 3.3 million (an increase of 1.7 million over a year ago). Number of insured unemployed out of work for 15 weeks or longer climbed to a postwar high of 1,450,000. An estimated 190,000 exhausted their state jobless benefits in March.

To President Eisenhower, the government figures reflected "a pickup in jobs in March and a leveling off of unemployment." But for AFL-CIO President George Meany there wasn't a "single ray of sunshine" in the report. He said the figures "indicate a continued deepening of the recession." And suggested that "the only way to change the situation is for the government to act now" through new legislation.

• **Construction**—The March rise of 140,000 in construction employment put the industry's March employment figure at 2,504,000—which is a loss of 252,000 from March a year ago.

Based on the new March figure, the current level of employment throughout the industry is lower than for any month in 1957 and lower than for any corresponding month since 1955.

Last month's improvement in construction employment was referred to by the Labor Department as "a greater than seasonal gain." Since the war, employment gains for the corresponding period have ranged from a minus figure in 1952 to plus figures of 21,000 to 124,000 in other years. Current increase of 140,000 is believed to represent a recovery of some of the loss "caused by unseasonably bad weather in February."

• **General picture**—Bulk of the increase in total unemployment is reported to have occurred in manufacturing, principally in durable goods industries such as autos, machinery and primary and fabricated metals.

A decline of 200,000 put manufacturing employment 1.5 million below the level of a year ago.

• **Jobless insurance**—The advance of 135,000 in state insured unemployment is reported to have occurred in 33 states. Except for Michigan, changes in individual states were relatively small. In the Pacific Northwest states, insured unemployment declined.

Initial claims for jobless benefits, according to the government, showed a slight downturn. But the number of workers who have been out of work long enough to exhaust their rights to benefits had increased. The estimated 190,000 exhaustions in March was 45,000 higher than the February total and 75,000 over a year ago.

• **Legislative action**—When Congress returns from its Easter recess this week, unemployment will be the first item on the hearing agenda of the House Banking and Currency Committee. Consideration of a number of proposals to revise or extend state jobless insurance benefits through federal action will be resumed by the House Ways and Means Committee (ENR April 10, p. 121).

At the state level, meanwhile, Arizona has joined Delaware and New York in increasing the amount of state benefits, upping its weekly maximum from $30 to $35.

In Maryland and Pennsylvania, employers are facing the prospect of higher payroll taxes as a result of heavy benefit payments in recent months. Changes in the New York law will increase the maximum tax on employers and will raise the levies on most seasonal employers. In Rhode Island there is a proposal to introduce the merit rating system which would place a proportionately higher tax on seasonal industries, such as construction and jewelry.

OFFICIAL PROPOSALS

RATE: The rate for Official Proposal advertising is $2.40 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.

CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.

SEND COPY TO: Official Proposal Division, Engineering News-Record Class. Adv. Div., P. O. Box 12, N. Y. 36, N. Y.

Bids: May 27, 1958

Sewage Works Improvements City of Tuscaloosa, Alabama

The City of Tuscaloosa, Alabama, will receive sealed Proposals for the construction of a new Sewage Treatment Plant until 10:00 A.M. Central Standard Time on the 27th day of May, 1958, at the office of the City Clerk, Tuscaloosa, Alabama.

All Proposals received will be publicly opened and read aloud in the City Council Chambers at Tuscaloosa, Alabama, beginning at 10:00 A.M. Central Standard Time on the 27th day of May, 1958.

The Contract Documents including plans and specifications are on file and available for inspection at the office of the City Engineer of the City of Tuscaloosa, Alabama, and at the office of Consoer, Townsend & Associates, Consulting Engineers, 360 E. Grand Avenue, Chicago 11, Illinois.

Copies of documents including plans and specifications for the proposed Sewage Treatment Plant required for review or bidding purposes may be obtained *only* from the City Engineer by depositing $65.00 at the office of the City Engineer for each set of documents so obtained.

The full amount of the deposit for one set of documents and one-half of the deposit for any additional sets of documents will be refunded to each bidder who submits a formal Proposal to the City of Tuscaloosa and who also returns the plans (and specifications on additional sets) in good condition to the City Engineer within ten (10) days after his bid security has been returned to him.

Equipment manufacturers, subcontractors, and others who do not submit formal Proposals to the City of Tuscaloosa will be refunded one-half (½) the amount of the deposit for all sets of complete documents including plans and specifications returned in good condition to the City Engineer within ten (10) days after the opening of bids. No refund will be made for documents received by the City Engineer after this (10) day period.

A certified check or bank draft drawn on a solvent bank, payable without condition to the City of Tuscaloosa, Alabama, in an amount not less than five percent (5%) of the bid shall be submitted with each Proposal as a guarantee that if the Proposal is accepted by the City of Tuscaloosa a Contract will be entered into and the performance of the contract properly secured. No bid shall be withdrawn after the opening of Proposals without the consent of the City of Tuscaloosa, Alabama, for a period of thirty (30) days after the scheduled time of closing bids. The bid securities of all bidders, except that submitted with the lowest acceptable Proposal, will be returned within ten (10) days after the time of opening bids. The bid security submitted with the lowest acceptable Proposal may be held by the City of Tuscaloosa until a construction contract has been executed and a satisfactory Performance Bond and a satisfactory Labor and Material Bond in the sum of the full amount of his contract has been delivered to the City.

The City of Tuscaloosa reserves the right to reject any or all Proposals and to waive any informalities or irregularities in the bids received, or to accept any Proposal which is deemed most favorable to the City at the time and under conditions stipulated in the Instructions to Bidders.

Contracts will be awarded on or before June 20, 1958.

In general, the improvement on which Proposals are requested is briefly described as follows:

The construction of a Sewage Treatment Plant having a nominal capacity to give Primary Treatment to a sewage flow of 12 M.G.D. The proposed Contract includes the furnishing of all labor, materials and equipment necessary for a complete operating installation.

Alternate Proposals are solicited on Major Items of Equipment as supplied by several manufacturers.

Plans and specifications for this project were prepared by Consoer, Townsend and Associates, Consulting Engineers, 360 E. Grand Avenue, Chicago 11, Illinois.

Dated at Tuscaloosa, Alabama
this 15th day of April, 1958.

CITY OF TUSCALOOSA, ALABAMA
Robert V. Hawkins
City Engineer

Bids: May 1, 1958.

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nine-thirty o'clock A.M., eastern standard time, on the 1st day of May 1958, by Henry A. Cohen, Director Bureau of Contracts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following Projects:

DISTRICT No. 3, E. ". TOWLSON, Acting District Engineer, 333 E. Washington Street, Syracuse, New York

County	Contract No.	Name
Oswego	FISH 58-9	Interstate Route 505 (Brewerton-Central Square) Oneida Lake Bridge Project I-1118(9)

Miles	Type	Deposit	Estimated Cost of Work
0.32	Asphalt Concrete, Ty. 1A=0.32 Mi. Including Oneida Lake Bridge 2 Prestressed Concrete Superstructures (Continuous) Each Superstructure— 3 Spans—320', 70', 70'	$119,000 Plans $10	$2,160,000

Any projects in this letting that are on the Federal Aid highway systems are subject to the provisions of the "Federal-Aid Highway Act of 1956", being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wage) Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal.

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds.

Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Instructions to Bidders".

The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

Bids: May 27, 1958

Erie County Water Authority

Notice is hereby given that sealed bids will be received in accordance with the law by the Erie County Water Authority until two o'clock P.M. Eastern Daylight Saving Time on the twenty-seventh day of May, 1958 at the office of the Authority, 338 Ellicott Square Building, Buffalo 3, New York, and will then be publicly opened and read.

The work to be done comprises furnishing all materials and labor, tools, plant and equipment necessary for constructing, installing and completing, ready for operation, the Sturgeon Point Filtration Plant, a rapid sand, gravity type water filtration plant with its low lift pumping station, having an initial capacity of sixteen (16) million gallons per day.

Copies of the plans and specifications may be examined without charge at the office of the Erie County Water Authority or at the office of Buck, Seifert and Jost, Consulting Engineers, 112 East 19th Street, New York 3, New York. Copies thereof may be obtained at either office upon deposit of One Hundred and Fifty ($150.00) Dollars, which sum will be refunded upon return of the plans and specifications in good condition within thirty (30) days after the date on which bids are received or else the entire deposit will be forfeited.

The work to be performed is divided into two (2) sections under which the work is classified according to its character. The principal items of work are as follows:

SECTION F—BUILDINGS AND STRUCTURES. Constructing the filtration plant and low lift pumping station structures complete including aerator, mixing basins, settling basins, filters, control and filter building, filtered water basin, washwater storage tank, decanting basin, sewage disposal system, piping around the plant, roadways, walkways, grading and other miscellaneous structures and appurtenances, including all plumbing, heating and electrical work.

SECTION G—FILTER, CHEMICAL AND PUMPING EQUIPMENT. Furnishing and installing the mixing equipment and piping; the flocculating equipment and piping; the filter piping, valves, controllers, sand and gravel, operating tables and other equipment; the chemical feed equipment and piping; the raw water, treated water and wash water pumping equipment and piping and all other special apparatus necessary to treat and pump the water.

Bidders will be allowed to bid on one (1) or both sections.

Each proposal must be accompanied by a certified check payable to the Erie County Water Authority or a bid bond to the favor of the Authority from a reliable surety company authorized to do business in the State of New York and satisfactory to the Authority, in amount equal to ten (10%) percent of the proposal. The certified check will be retained to pay for any damage or loss to the Authority, or the liability bond will accrue, in case the successful bidder shall neglect or refuse to enter into a contract in accordance with his proposal.

The Authority reserves the right to consider bids for forty-five (45) days after their receipt before awarding any contract and the right is reserved to accept any bid or to reject any or all of them.

The Authority has submitted applications for permits to construct the project to various Federal and State Authorities having jurisdiction and Contracts will not be executed by the Authority until these permits are issued.

ERIE COUNTY WATER AUTHORITY
By: WILLIAM J. CARNEY
Secretary

Buck, Seifert and Jost
Consulting Engineers

Dated: April 17, 1958

(Continued on the following page)

OFFICIAL PROPOSALS

Bids: April 24, 1958.

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.,—Pursuant to the provisions of the Highway Law, Canal Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., eastern standard time on the 24th day of April 1958, by Henry A. Cohen, Director Bureau of Contracts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following Projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 2, L. KETCHUM, District Engineer, 109 No. Genesee Street, Utica 1, New York						
Montgomery	M 58-5	Work at Dam No. 11 on Barge Canal at Fort Plain	....	Furnishing and Installing New Uprights and Other Miscellaneous Work	$9,000 Plans $10	$175,000
DISTRICT No. 3, E. E. TOWLSON, Acting District Engineer, 333 E. Washington Street, Syracuse, New York						
Cortland (Rte. 41)	FARC 58-10	McGrawville, S.H. 378 McGrawville-Solon, S.H. 5436 Project F-525(3)	2.07	Asphalt Concrete, Type 1A=2.07 Miles	$27,000 Plans $2	$504,000
Tompkins (Rte. 96)	FARC 58-14	Trumansburg-Ithaca, S.H. 616 Project F-128(3)	1.43	Asphalt Concrete, Type 1A=1.43 Miles	$8,000 Plans $2	$143,000
DISTRICT No. 4, B. F. PERRY, District Engineer, Barge Canal Terminal, Rochester 1, New York						
Monroe	M 58-4	Barge Canal Wall at Bushnell's Basin	....	Repairing and Rebuilding Portions of Canal Wall	$8,000 Plans $10	$152,000
Monroe	M 58-3	Barge Canal Bridges E-127 and 137	....	Cleaning and Painting 2 Bridges	$300 Plans $10	$5,000
DISTRICT No. 5, E. G. H. YOUNGMANN, District Engineer, State Office Building, 65 Court Street, Buffalo 2, New York						
Chautauqua (Rte. 17)	FAC 58-5	City of Jamestown: East Second Street (Tiffany Ave. to Winsor St.) Project F-449(8)	1.61	Asphalt Concrete=1.60 Miles Miscellaneous Work=0.01 Mile	$11,000 Plans $2	$205,000
Erie (Rte. 198)	FASCE 58-1	Scajaquada Creek Expressway: Section 2 (Niagara St. to Delaware Ave.) Project U-UG-1087(3)	1.91 (1.95 Acc.)	Asphalt Concrete=1.37 Miles; Miscellaneous Work =0.54 Mile; 5 Twin Box Culv. Each 20' Wide; 2 H.G.S. Welded Plate Girders 257', 279.9'; 1 R.R.G.S. Welded Plate Girder 222.6'; 2 Bridges—Rolled Beam Girder 90', 160'; 1 Bridge—Welded Plate Girder 139'	$400,000 Plans $10	$7,315,000
DISTRICT No. 6, J. H. THOMAS, District Engineer, State Office Building, 30 West Main Street, Hornell, New York						
Steuben (Rte. 70)	FARC 58-20	Big Creek, Pts. 1 & 2, S.H. 906; Big Creek, Pt. 3, S.H. 1000A; Big Creek, Pt. 4, S.H. 907; Bath-Avoca, S.H. 5204. Project F-867(4)	5.58	Asphalt Concrete (and Bridge Repair)=5.42 Miles Miscellaneous Work=0.16 Mile	$50,000 Plans $5	$944,000
DISTRICT No. 7, R. W. SWEET, District Engineer, 444 Van Duzee Street, Watertown, New York						
Jefferson (Rte. 11)	FARC 58-18	Philadelphia-Antwerp, S.H. 5548 Antwerp-County Line, S.H. 5427 Project F-476(6)	6.63	Asphalt Concrete=6.63 Miles	$77,000 Plans $5	$1,400,000
St. Lawrence (Rte. 37)	FARC 58-13	Massena-Helena, Pt. 1, S.H. 1261 Project F-580(12)	2.08	Asphalt Concrete, Type 1A=1.97 Miles Miscellaneous Work=0.11 Mile	$55,000 Plans $3	$990,000
St. Lawrence	OBA 58-4A	*Ogdensburg Bridge: Contract No. 4A	....	U.S. Approach Spans Superstructure; 6 Truss Spans @ 251.3' Each: 2-4 Span Continuous Girders @ 510' Each	U.S. $169,000 Plans $3	U.S. $3,077,220
Grenville, Ontario, Canada	OBA 58-4C	*Ogdensburg Bridge: Contract No. 4C	....	Canadian Approach Spans Superstructure; 6 Truss Spans @ 251.3' Each; 3-3 Span Continuous Girders @ 382.5' Each	U.S. $180,000 Plans $3	U.S. $3,223,775

*Note Well: The Plans and Proposals for Contracts OBA 58-4A and OBA 58-4C Will Be Available at P. L. Pratley, Cons. Engr., 909 Drummond Bldg., Montreal, Quebec, Canada: and Modjeski and Masters, Cons. Engrs., Forster at Sixth, Harrisburg, Penn., as well as the N.Y.S. D.P.W. Offices Listed.

DISTRICT No. 9, J. C. FREDERICK, District Engineer, 71 Frederick Street, Binghamton, New York.						
Otsego (Rte. 28)	FARC 58-16	Colliersville-Milford Center, S.H. 318; Milford Center-Milford, S.H. 674; Milford Village, S.H. 783 Project F-469(3)	8.21	Asphalt Concrete, Type 1A=8.21 Miles; Widen 2 Reinf. Conc. Beam Bridges Spans 24.7' and 30'	$79,000 Plans $10	$1,433,000
DISTRICT No. 10, M. E. GOUL, District Engineer, 325 W. Main Street, Babylon, L. I.; New York						
Nassau (Rte. 27)	RC 58-21	Conduit Blvd., Pt. 3, S.H. 1099A	0.09	Twin Elliptical Concrete Pipe Culvert	$2,300 Plans $2	$42,000

Any projects in this letting that are on the Federal Aid highway systems are subject to the provisions of the "Federal-Aid Highway Act of 1956", being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wage) Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal.

Maps, plans specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defence Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Instructions to Bidders".

The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

Bids: April 24, 1958.

Soil Explorations and Foundation Investigations

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Highway Law, sealed proposals will be received until 10:30 a.m. Eastern Standard Time, on April 24, 1958, by Henry A. Cohen, Director, Bureau of Contracts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y. for:

SOIL EXPLORATIONS AND FOUNDATION INVESTIGATIONS AT VARIOUS SITES ON GOWANUS EXPRESSWAY, FEDERAL INTERSTATE ROUTE 512, EAST END OF NARROWS BRIDGE APPROACH TO SOUTH END OF BROOKLYN-QUEENS EXPRESSWAY, PROJECT 1-1006(19), ITEM 29B, KINGS COUNTY, WHICH CONSTITUTES CONTRACT SPEC. NO. FA-SM-123.

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, N. Y.
(b) Mr. M. E. Goul, District Engineer, New York State Department of Public Works, 325 West Main Street, Babylon, Long Island, N. Y.
(c) Mr. William M. Trainer, Associate Contract Engineer, Department of Public Works, 270 Broadway, New York City.

The deposit for a set of plans, specifications and proposal forms is $5.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50 percent of deposit.

The Engineer's Estimate of cost for this work is $49,875.00.

Proposal for this contract must be submitted in separate sealed envelope with the name of the contract plainly endorsed on the outside of the envelope. Proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of $3,000.00. The retention and disposal of the bdiding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instruction to Bidders".

The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPERINTENDENT OF PUBLIC WORKS

OFFICIAL PROPOSALS

Bids: May 6, 1958

Power Authority of the State of New York

for Construction of
Massena Town Beach and Barnhart Island Bathhouses,
Information Center,
Long Sault, Barnhart and Hawkin's Point Overlooks near Massena
St. Lawrence County, New York
Specifications No. PA-5-11039
St. Lawrence Contract No. SP3

NOTICE TO CONTRACTORS: The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for the construction of Massena Town Beach and Barnhart Island Bathhouses, Information Center, and Long Sault, Barnhart and Hawkin's Point Overlooks, near Massena, St. Lawrence County, New York until 2:30 P.M., Eastern Daylight Saving Time on the 6th day of May at the Coliseum Tower, 18th floor, 10 Columbus Circle, New York 19, New York, at which time and place proposals will be publicly opened and read aloud.

The principal work consists of the construction of beach structures consisting of bathhouse and refreshment stand at Massena Town Beach and Barnhart Island Bathhouse structures, an information building at the entrance of the St. Lawrence Project and Long Sault, Barnhart and Hawkin's Point Overlook structures.

All work shall be completed on or before December 31, 1958.

Plans, Specifications and Proposal Forms for the work may be obtained from the Power Authority of the State of New York, at the Coliseum Tower, 18th floor, 10 Columbus Circle, New York 19, New York, upon application and prepayment of a fee of Twenty-five ($25.00) dollars per initial set and Ten ($10.00) dollars per set for additional sets, no part of which will be refunded. Plans, Specifications and Proposal Forms for the work will be on file in the Authority's office, and in the offices of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, and may be inspected by prospective bidders during office hours.

Bids must be made and returned in duplicate in accordance with instructions contained in the Information for Bidders. Guarantee will be required with each bid in an amount not less than 20 percent of the gross sum bid.

The right is reserved to reject any or all bids.

W. S. Chapin
General Manager

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OFFICIAL PROPOSALS

Bids: May 2, 1958

New York State Bridge Authority

NOTICE TO BIDDERS
Poughkeepsie, New York

Sealed proposals will be received by the New York State Bridge Authority at its office at Mid-Hudson Bridge Plaza, Poughkeepsie, until 2:00 P.M. Eastern Daylight Saving Time on the 2nd day of May, 1958, at which time and place they will be publicly opened and read, for the furnishing of the labor and materials necessary for the complete cleaning and repainting of the Rip Van Winkle Bridge spanning the Hudson River at Catskill, New York.

Plans, specifications, proposal blanks, form of contract, bond and information for bidders may be seen at the office of the New York State Bridge Authority, Mid-Hudson Bridge Plaza, Poughkeepsie, New York; at the offices of Modjeski and Masters, Consulting Engineers, Sixth Street at Forster, Harrisburg, Pennsylvania, and copies of the same may be obtained therefrom upon a deposit of Fifteen Dollars ($15.00), which sum will be refunded if the plans and specifications are returned by bidders in good condition within twenty (20) days of bids having been received and acted upon by the New York State Bridge Authority, and Ten Dollars ($10.00) will be so returned to non-bidders.

A certified check on a National Bank, State Bank or Trust Company in the sum of ten per cent (10%) of the amount of the bid, made payable to the New York State Bridge Authority must accompany the bid, as a guarantee that the contract will be entered into, if awarded.

A faithful performance bond in the sum of one hundred per cent (100%) of the contract price will be required.

A labor and material bond will also be required.

The New York State Bridge Authority reserves the right to reject any or all bids.

JOHN S. STILLMAN
Chairman

Bids: May 13, 1958

Procurement Department City of Philadelphia

Sealed bids will be received and read publicly in Room 313, City Hall Annex on Tuesday May 13, 1958 at 2:30 P.M. EDST for the Dept. of Streets proposal listed below. No bids will be accepted unless a Questionnaire & Financial Statement for Qualifying Bidders with all questions fully answered is filed with Commissioner in Room 904 City Hall Annex at least one (1) week prior to the date of opening of bids. Information pertaining to form of contract and bonds may be obtained in Room 715, City Hall Annex. Plans, Specifications and Questionnaire & Financial Statement for Qualifying Bidders may be obtained in Room 1012 City Hall Annex. A deposit of $25.00 in cash or certified check will be required for each set of plans and specifications. Deposit will be refunded upon return of the plans and specifications in good condition within 10 days after the bids are opened. Bids: General Building Construction of Northwest Incinerator Plant—Umbria St. & Domino Lane; Plumbing Construction—Northwest Incinerator Plant; Electrical Construction—Northwest Incinerator Plant; Heating & Ventilating Work—Northwest Incinerator Plant; Furnishing & Installation of Mechanical Equipment—Northwest Incinerator Plant; Furnishing & Installation of 2 6-ton Traveling Bridge Cranes—Northwest Incinerator Plant.

Michael H. Sura, Commissioner.

Bids: April 29, 1958

Contract PN-530.001

THE PORT OF NEW YORK AUTHORITY
PORT NEWARK
DEMOLITION—NORTH SIDE OF CHANNEL

Sealed proposals for the demolition of all or portions of Buildings Nos. 201, 202, 203, 243, 262, 263, 268 and 269 on the north side of the Channel at Port Newark will be received at the office of the Chief Engineer of

OFFICIAL PROPOSALS

The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, April 29, 1958, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Engineer of Design of the Authority, Room 1115. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, April 17, 1958

Bids: May 6, 1958

Contract PN-520.001

THE PORT OF NEW YORK AUTHORITY
PORT NEWARK
PORT STREET INTERCHANGE

Sealed proposals for the construction of a traffic interchange between Port Street and Terminal Street at Port Newark will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N.Y., until 2:30 P.M. on Tuesday, May 6, 1958, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Engineer of Design of the Authority, Room 1115. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, April 17, 1958

Bids: May 7, 1958

Mackinac Bridge Authority

Advertisement for Proposals
for
Tower Elevators
for the
Mackinac Bridge

The Mackinac Bridge Authority will receive sealed proposals for Contract No. 12, Tower Elevators for the Mackinac Bridge until 2:00 P.M., Eastern Standard Time on the 7th day of May 1958 at the office of the Authority, Mackinac Bridge St. Ignace Michigan, at which time and place proposals will be publicly opened and read aloud.

The work includes the following:

Furnishing and installing two (2) service elevators, one in each of the main towers of the suspended spans, with all equipment and incidental work thereto for a complete installation ready for operation.

Plans, Specifications, Proposal Form and Contract Documents for the work are on file in the office of the Mackinac Bridge Authority and in the office of D. B. Steinman, Consulting Engineer, 117 Liberty Street, New York 6, New York, and may be inspected by prospective bidders during office hours.

Plans, Specifications, Proposal Form and Contract Documents may be obtained from D. B. Steinman, Consulting Engineer, 117

(Continued on the following page)

OFFICIAL PROPOSALS

(Continued from preceding page)

Liberty Street, New York 6, New York upon application and payment of a fee of fifteen ($15.00) dollars, ten ($10.00) dollars of which will be refunded upon return of the Plans to non-bidders, and all of which will be returned to bidders.

Bids must be made upon the proposal form included in the Contract Documents. Each proposal must be accompanied by draft or certified check payable to the order of the Mackinac Bridge Authority for the sum of ten thousand ($10,000.00) dollars.

The right is reserved to reject any or all bids.

MACKINAC BRIDGE AUTHORITY
Prentiss M. Brown, Chairman

April 3, 1958

Bids: May 16, 1958

Metropolitan Sewer District Louisville, Kentucky

INVITATION TO QUALIFIED CONTRACTORS

Sealed bids for the construction of two sections of the Ohio River Interceptor, under two separate and distinct contracts hereinafter described, will be received at the office of Metropolitan Sewer District, 412 West Market Street, Louisville, Kentucky, until 12 noon Central Standard Time on May 16, 1958, and will be publicly opened and read at that time.

CONTRACT 226F, OHIO RIVER INTERCEPTOR, SECTION "F", includes construction of about 840 linear feet of 8-foot sewer, 6,770 linear feet of 7-ft. 6-in. sewer, and appurtenant work. Alternate bids on monolithic concrete semi-elliptical sewer and precast concrete Pipe circular sewer, each in open cut or tunnel, are permitted for the 8-ft. portion of the interceptor. The 7-ft. 6-in. sewer must be constructed in tunnel of monolithic concrete and of semi-elliptical section.

CONTRACT 226G, OHIO RIVER INTERCEPTOR, SECTION "G", includes construction of about 1,450 linear feet of 7-ft. 6-in. sewer and 3,640 linear feet of 7-ft. sewer both in tunnel of monolithic concrete and of semi-elliptical section. The contract also includes construction of about eleven (11) underground manholes and chambers, and miscellaneous small sewer connections, portions of which require tunneling.

A bidder may bid one or both contracts, each to be considered as a separate unit for the purpose of making awards. Bidders who bid on both contracts will be given an opportunity to state an amount by which the total price of both contracts shall be reduced, if both are awarded to the same bidder. The Metropolitan Sewer District shall have the right to award both contracts to the lowest such bidder, if his combined bid, reduced as stated above, is less than the total of the lowest bids submitted singly for each contract.

Plans, specifications and information for bidders may be examined and obtained at the office of the District or examined at office of Metcalf & Eddy, Engineers, 1300 Statler Bldg., Boston 16, Mass., on or after April 17, 1958; $50 deposit on each set of drawings and documents for each contract. Said deposit will be refunded as set forth in Information to Bidders.

The District reserves the right to reject any or all bids or waive any informality in any bid and to accept any proposal considered by the District to be on the whole the best.

Bid security: $70,000 certified check for each contract on a Louisville, Ky., or New York City bank, payable to the District. Successful bidders must furnish 100% Performance Bond for each contract and 50% Payment Bond for Contract 226G only.

LOUISVILLE AND JEFFERSON COUNTY METROPOLITAN SEWER DISTRICT
Louis J. Herrmann, Sr.
Chairman

Bids: May 1, 1958

Construction of New Bridge Over Jordan Creek

The County Controller of Lehigh County will receive sealed Proposals for the construction of a new Fourth Street Bridge over Jordan Creek until 11:00 A.M. (D.S.T.), May 1, 1958; at his office in the Lehigh County Court House Annex Building, Allentown, Pa.; and will publicly open said Proposals in the Meeting Room of the Lehigh County Commissioners after 11:15 A.M. (D.S.T.) of the same day.

Copies of the Plans, Specifications and Proposal Forms can be obtained at the office of G. Edwin Pidcock Co., Consulting Engineers, 546-548 Hamilton St., Allentown, Pa., upon payment of Fifty Dollars ($50.00) for each set. Any Bidder, upon returning such set in good condition within ten (10) days after the opening of the Proposals will be refunded Twenty-five Dollars ($25.00) of his payment.

Each Bidder must deposit with his Proposal, a certified check or surety company's bid bond in an amount of not less than five (5) percent of the base bid as defined in the Instructions to Bidders.

Proposals must be submitted in duplicate on the forms prepared by the Consulting Engineer and shall be placed in a sealed envelope properly identified, which must be in the hands of the County Controller at or before the time above mentioned.

No Bidder may withdraw his Proposal within fifteen (15) days after the actual date of the opening thereof.

The Lehigh County Commissioners reserve the right to waive any informalities in, or to reject any or all Proposals.

Alan F. Weinsheimer
County Controller

Bids: April 29, 1958.

Power Authority of the State of New York

ADVERTISEMENT FOR PROPOSALS
For Reforestation Work
During 1958 and 1959
In Construction Areas and State Park
St. Lawrence County, New York
Specifications No. PA-5-11037
St. Lawrence Contract No. 46

NOTICE TO CONTRACTORS:

The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for Reforestation Work during 1958 and 1959 in Construction Areas and State Park, St. Lawrence County, New York, until 10:30 A.M., Eastern Daylight Saving Time on the 29th day of April, 1958 at the Authority's office, 18th floor, the Coliseum Tower, 10 Columbus Circle, New York 19, New York, at which time and place the proposals will be publicly opened and read aloud.

The estimated quantities of work are:

Furnishing and
and planting—50,548 deciduous trees
Planting—324,428 evergreen seedlings

All of the reforestation work shall be completed on or before July 15, 1959.

Plans, Specifications and Proposal Forms for the work, may be obtained from the Power Authority of the State of New York, at 18th Floor, the Coliseum Tower, 10 Columbus Circle, New York 19, New York upon application and prepayment of a fee of Ten Dollars ($10.00) per initial set of contract documents, and Five Dollars ($5.00) per set for additional sets, no part of which will be refunded. Plans, Specifications and Proposal Forms for the work will be on file in the Authority's Office and in the offices of the Engineer, Uhl, Hall & Rich, 220 Congress Street, Boston 10, Massachusetts, and The Hydro-Electric Power Commission of Ontario, 620 University Avenue, Toronto 2, Ontario, and may be inspected by prospective bidders during office hours.

Bids must be made in duplicate in accordance with instructions contained in the Information for Bidders. Guarantee will be required with each bid in an amount not less than 20 percent of the gross sum bid.

The right is reserved to reject any or all bids.

W. S. Chapin
General Manager

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5039) will be received at Superior, Nebraska until 10 a.m., Central Standard Time, May 20, 1958, for furnishing labor and materials for earthwork and structures, Courtland canal, Station 2809+00 to end, and laterals, wasteway, and drains, Bostwick Division, Nebraska-Kansas, Missouri River Basin Project. Location near Courtland, Kansas. Principal items are 328,000 cu. yds. excavation; 900 cu. yds. concrete in structures; 840 lin. ft. corrugated, metal pipe; 5,900 lin. ft. concrete pipe, 12- to 42-inch; and other work. Completion time 390 days. For particulars, address Bureau of Reclamation, Post Office Box 431, Superior, Nebraska; or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

OFFICIAL PROPOSALS

CONTRACTORS WATCH THIS SECTION

for New Projects

Publish your announcements thru the "Proposal Section" of Engineering News-Record and get their bids.

Employment Opportunities

ADDRESS BOX NO. REPLIES TO: Box No.
Classified Adv. Div of this publication.
Send to office nearest you.
NEW YORK 36: P. O. BOX 12
CHICAGO 11: 520 N. Michigan Ave.
SAN FRANCISCO 4: 68 Post St.

POSITIONS VACANT

Civil Engineers: Have openings for young, aggressive, ambitious Civil Engineer college graduates for field construction work in Mid-Western Area of the U.S. P-7667, Engineering News-Record.

Construction Superintendent: Building construction superintendent, age 28 to 40, aggressive, ambitious, experienced, willing to move, for sizeable building projects. Give full information on experience and projects handled. P-7632, Engineering News-Record.

Engineer Estimator: At Present in Detroit, Michigan area but must be willing to relocate if necessary. Must have quantity survey and construction experience. Opportunity for permanent employment and advancement. P-7609, Engineering News-Record.

Civil Engineer with 6 years professional experience including 2 years in work related to Governmental Regulation of Public Utilities. Write: State Personnel Department, State Office Building, Hartford, Connecticut.

Wanted—Field Engineer, Estimator. Excellent opportunity for advancement in well established growing General Contracting firm Poughkeepsie area. Salary open. P-7693, Engineering News-Record.

Design Engineer for a progressive company employing 125 in Central Florida. Design & standardization of aggregate bins, Silos, and conveying systems for concrete Redi-Mix plants & allied fields. 3 to 5 years direct experience in this field required. Replies should include complete resume & salary expected. P-7611, Engineering News-Record.

Civil-Sanitary Sales Engineers needed by manufacturer of major water, sewage and waste treatment equipment serving entire U. S. Experienced preferred. Location: Midwest, Pacific Coast and Southeast. Salary open plus commission. Send experience resume. P-7717, Engineering News-Record.

WANTED: Qualified Reinforcing Steel Estimator required by Fabricator. Good Opportunity for advancement. Brocker Mfg. & Supply Co., York, Pennsylvania.

Registered P.E.—Civil and Soils. Established Florida Laboratory specializing concrete, asphalt, core drilling, foundations and high level soil mechanics. Florida experience in foundation design or graduate degree desirable. State detailed education, experience and salary. Enclose late closeup photo. Replies confidential. P-7725, Engineering News-Record.

(Continued on opposite page)

EMPLOYMENT OPPORTUNITIES

DISPLAYED

The advertising rate is $39.20 per inch for all advertising appearing on other than a contract basis. Frequency rates quoted on request.

An advertising inch is measured 7/8" vertically on a column—3 columns—30 inches to a page.

Subject to Agency Commission.

—RATES—

UNDISPLAYED

$2.40 per line, minimum 3 lines. To figure advance payment count 5 average words as a line.
Position Wanted ads take ½ of above rate.
Box Numbers—count as 1 line.
Discount of 10% if full payment is made in advance for 4 consecutive insertions.
Not subject to Agency Commission.

Send NEW Ads and Inquiries to Classified Advertising Division of ENGINEERING NEWS-RECORD
P. O. Box 12, N. Y. 36, N. Y. May 1st issue closes April 21st.

POSITIONS VACANT

(Continued from opposite page)

Civil Engineer—If you have a Bachelor's degree or more in Civil Engineering and in addition have two years of satisfactory experience in either Civil Engineering or personnel examining, we have a position for you in the Examinations Division of the New York State Department of Civil Service in Albany, New York. You will be performing responsible technical work in examining for positions in the field of Engineering. The salary range for this 5 day 37½ hour week position is $6140—$7490. In addition there are many fringe benefits. All qualified United States citizens are invited to write for further information to Box F, Recruitment Unit, New York State Department of Civil Service, 39 Columbia Street, Albany, New York.

Wanted — Construction Superintendents — Long established Mid-West General Construction firm has openings for two or more qualified field construction superintendents. Engineering background preferred but not required. Applicants should be aggressive, cost conscious and well grounded in reinforced concrete, structural steel, and masonry structures. Complete education, experience data and salary expected should be furnished in first reply. P-7751, Engineering News-Record.

EMPLOYMENT SERVICE

Better Positions—$6,000 to $35,000. Want a substantial salary increase, more opportunity or different location? This national 47 year old service connects you with best openings. You pay us only nominal fee for negotiations: This we refund when employer pays placement fee. Present position protected. In complete confidence, write for particulars, R. W. Bixby, Inc., 559 Brisbane Bldg., Buffalo, N. Y.

POSITIONS WANTED

BSEE MIT PE NY 15 years exp. bldg & airport design & construction, electronics maintenance seeks connection involving occasional travel or assignment overseas, pref. Far East. PW-7563, Engineering News-Record.

Teaching position desired. Age 31, P.E., M.S. in San Engr. Exp: design of several sewage treat. plants (incl. $6 million plant under constr.); university instructor; highway engineering. PW-7551, Engineering News-Record.

Civil Engineer for technical sales. Young, Dutch-trained, seven years experience in heavy pre-fabricated and pre-stressed concrete construction, manufacture, estimation. PW-7593, Engineering News-Record.

Construction Supt 22 years experience all phases highway work. PW-7658, Engineering News-Record.

Purchasing—Well rounded experience in procurement for heavy construction and general contracting, good administrator and able to handle sub-contractor. PW-7663, Engineering News-Record.

Materials Engineer—Administration, engineering and laboratory supervision on multi-million dollar Government and private projects. Soil Mechanics—specifications, design and construction of roads, airfields, dams, structural foundations, site grading. Concrete and Asphalt—specifications, site grading. Concrete and Asphalt—specifications, mix designs, batch plants, placement, pavement design. Experience also—prestressed concrete, precast units, structural steel. PW-7679, Engineering News-Record.

(Continued on the following page)

ENGINEERS AND MANAGERS

General contractor will add to expanding organization, men qualified for large projects overseas and domestic, experienced in supervision of construction, maintenance and operation of military installations.

This will include men with professional engineering and management experience in airports, power, water, sewage, structures, pavement and grounds, construction and administrative type vehicles, fire and crash rescue and food service operations.

Experience in the Airforce installation engineering field or Army post engineering field, and military vehicle administration or military mess operation are desirable.

In reply include education, age, experience, salary requirement, and state overseas area willing to relocate in your resume. The completeness of your resume will qualify you for an interview. All replies to be held in strict confidence.

P-7709, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

OPPORTUNITY FOR A

$25,000 A YEAR ENGINEER!

A first-class experienced Project Director with managerial, design and construction qualifications is required for classified, long-term Government project. In writing give academic and professional background and security clearances. Headquarters in New York City. Reply to . . .

P-7703, Engineering News-Record
Class. Adv. Div., P. O. Box 12, N. Y. 36, N. Y.

ENGINEERS

Foreign Employment

MAINTENANCE, SCHEDULING & PROGRAMMING

Career opportunities for graduate engineers with minimum 6 years experience supervising maintenance engineering functions in oil refining or producing facilities, power plants, heavy industrial installations and supporting community facilities. For work in Saudi Arabia as Staff Engineers. Also opportunity for engineers with production control experience.

High salary plus liberal all-inclusive benefits conducive to large savings. Excellent community facilities.

Write outlining background and experience. Please include telephone number.

Recruiting Supervisor, Box 215

ARABIAN AMERICAN OIL COMPANY
505 PARK AVENUE
NEW YORK 22, NEW YORK

GENERAL SUPERINTENDENT FOR HEAVY CONSTRUCTION DIVISION

Excellent opportunity for man capable of supervising heavy construction projects at various locations throughout the South. Type of work normally includes bridges, pile driving operations, dock construction, dam construction, and sewerage treatment plants. This position requires an executive who is qualified and experienced to supervise all field construction and assist in preparation of bids. Write fully, giving education, past experience, references, availability, salary requirements, and personal data to

Blount Brother Construction Company
Post Office Box 949
Montgomery, Alabama
Attention:
Heavy Construction Division

ASSISTANT TRAFFIC ENGINEER

$597 to $776 a month, including annual automatic and longevity salary increases. **Starting salary** may be at any step in basic range ($597 to $712) depending upon qualifications. Interview and moving expenses paid by city. U. S. citizenship required, but no residence restrictions for man to begin work. Registration as a professional engineer required. Wisconsin Retirement Fund and Social Security Benefits.

CITY PERSONNEL DEPARTMENT
404 City-County Building,
Madison 9, Wis.

ENGINEER

For employment in home office of large building contractor. Permanent position with opportunity for advancement with aggressive, growing company operating throughout the U. S. Experience in estimating desirable. Experience as field engineer or field office engineer desirable. State fully education, experience, military status. Personal data and salary requirements to:

Blount Brothers Construction Company

P. O. Box 949, Montgomery, Alabama

DESIGNERS and DETAILERS

Experienced in the design or detailing of Erection Methods for Bridges and Structures. Write stating age, education and exper. Engineering office located New York City. Reply:

P-7591, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N. Y. 36, N. Y.

SENIOR ESTIMATOR

Required by a growing engineering and construction firm in East. Must be familiar with complete estimates from flow diagrams for chemical plants. 5 to 10 years experience in actual estimating required. Excellent opportunities. Salary open.

P-7650 Engineering News-Record
Class Adv. Div., P. O. Box 12, N. Y. 36, N. Y.

OVERSEAS

Exclusive monthly detailed reports on foreign construction projects. Individual and Company Membership available. Write for details Overseas Americans, Inc., 7 West 44th St., New York 36, N. Y. Dept. N.

SALESMEN WANTED

Experienced in calling on concerns doing heavy construction and foundation work, familiar with steel pipe piling. Excellent earnings for right man.

SW-7706, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

YOUNG FOUNDATION ENGINEER

Wanted by manufacturer of tubular steel piles. Experience in pile foundation construction and design desirable. Work involves travel from central headquarters. Position is permanent—offers good opportunity for advancement. Salary commensurate with useful experience. Mail personal and experience record to W. H. Robertson, The Union Metal Manufacturing Co., Canton, Ohio.

POSITIONS WANTED

(Continued from preceding page)

Soils & materials engineer; M.S (Soil Mech.) & M.S (Highwy. Engg.); about ten years design office & field experience; special experience in soils and foundations; regd. P.E.; present emoluments about $10,000 annual; single; 39; available April, any location. PW-7672, Engineering News-Record.

Archt.—Struct. Engr. exp. design, supv., estimating of indust., commer., munic., constr., desires position with archt., engr., constructor. PW-7686, Engineering News-Record.

Construction Manager—38, BS Civil Eng., MS Indus. Management, P.E. N.Y. & Ga. 11 yrs chemical plant design & constr. Outstanding record past 3 yrs supervising 7 major projects totalling $40 million; capable also as executive assistant or construction-engineering sales. PW-7713, Engineering News-Record.

Civil Engineer available for foreign work preferably Europe. 5 years experience, U.S. & abroad, highway, earthwork, tunnel, construction, design, estimate, English & German perfect, Spanish. PW-7621, Engineering News-Record.

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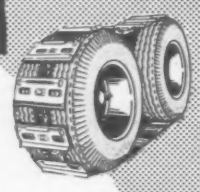

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Single Industry Concept Needed by Construction

ONLY IN EMERGENCIES, it would seem, do construction people consciously think of themselves as part of a single, great industry. They did so during the war. And now in these uncertain days, when the "construction industry" is being headlined in the press and heralded from the halls of Congress to village street corners as the bellwether of business recovery, everyone, who in one way or another makes his living from construction, reacts with a glow of pride. Such a feeling should be made permanent.

It is right and proper, of course, for an architect to think of himself as an architect, for a structural engineer to classify himself as a structural engineer or even for a contractor to regard himself as being a part of the highway industry or a bridge builder, an earthmover or driver of tunnels. But it is equally right and proper, and not at all inconsistent, for anyone of these persons to think—and perhaps to think first—that he is also a member of an all-encompassing construction industry.

Were such a single industry concept to prevail universally—and continuously—in the field of construction, much good could result. Coordination of the many diverse elements on a construction job might well come easier. Construction industry dealings with the public would benefit from the resulting united front that could be presented. Technical education would be given a broader base and a sharper focus. And there are many more possible advantages.

One of the obstacles to broad acceptance of the single industry concept of construction is said to be a doubt that construction can really rate as an industry. Because its activities are widespread and often seemingly unrelated as compared with, say, manufacturing, which is accepted as an industry, construction is looked upon as another breed of cat. The truth of the matter is that manufacturing and construction are very much alike.

MANUFACTURING, for example, encompasses research, development, production and marketing as its prime functions—with many a technical and business service, professional or otherwise, performed in the process of getting its products to the consumer. In construction the familiar research and development of manufacturing are lumped as design—meaning everything from studies to preparation of plans. The actual field operations of converting plans to realities are certainly production. And, while marketing takes many forms, none would deny that construction's products must be "sold" at some stage in the process.

Manufacturing encompasses many technical and business services before its products are ready for the consumer, but so also does construction. Owners must first express a need or demand for the facility to be constructed; bankers must study it and assure its financial support; then engineers and architects must analyze, design and specify; lawyers, insurance men and realtors have their parts to play; and finally there are the contractors, materials and equipment suppliers, inspectors and, in cases, the operators of the projects—all performing their essential roles as members of the construction industry.

CONSTRUCTION is indeed an industry, and one with unusual unity of purpose and procedures. It is also a big industry (one seventh of all business activity), and it is basic (providing shelter, power, sanitation, water, transportation, communication and all the other fixed physical facilities that make our modern standards of living possible). Only by thinking of construction as a single industry can such significant and satisfying facts as these have full meaning—and lead to a proper appreciation of construction's breadth, depth, importance and wealth of opportunities.

Such appreciation is vital to construction's future. For example, because no one has thought to impress them with the construction industry idea, engineering students seldom think in industry terms, but only in those of one of its specialties. As a consequence, because the opportunities thus appear to be limited, there is a danger that an insufficient amount of technical brainpower will be attracted to the industry to man its leadership jobs for the future. The single industry concept, with the vision it conjures up of wide job opportunities, would reduce this danger without in any way changing the appeal of the various specialties.

Further with respect to construction's future, the complexities of projects today require that the services of civil engineers be supplemented by the talents of many other kinds of engineers and specialists. A single construction industry concept would be a powerful aid in attracting such people to construction service—and keeping civil engineers from wandering to other pastures.

And finally there are the relations with the public and the press, with legislative bodies and with other segments of the economy, which would be clarified and simplified if a single industry concept prevailed throughout every nook and cranny of construction.

In a future in which the nation's welfare will be increasingly dependent on the manifold services of construction, a single industry concept of these services will be more than ever necessary. It is needed today. And since no diminution in the individuality or importance of the various specialties that make up construction is involved, all that is required is mental acceptance of the fact that the whole is greater—and more powerful, influential and appealing—than its parts.

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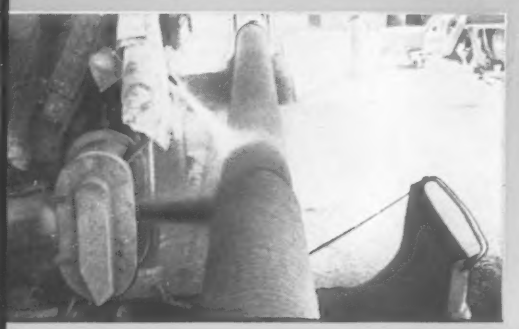

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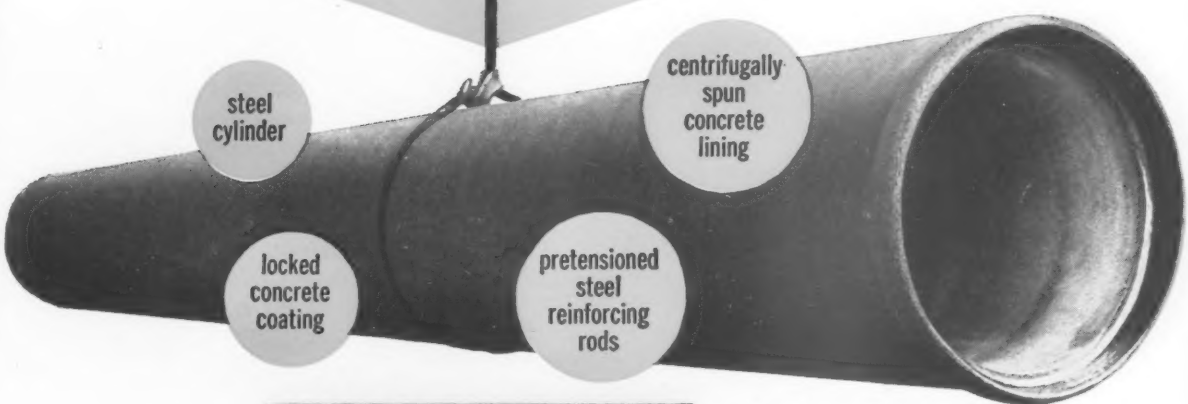

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